



LIBRARY
TALLAHASSEE
FLORIDA

NO. 918


Carpenter

CARPENTER'S WORLD TRAVELS

*Familiar Talks About Countries
and Peoples*

WITH THE AUTHOR ON THE SPOT AND THE
READER IN HIS HOME, BASED ON A
HALF MILLION MILES OF TRAVEL
OVER THE GLOBE

"READING CARPENTER IS SEEING THE WORLD"



Digitized by the Internet Archive
in 2024

17/20
Lands of the Andes
and the Desert



IN THE LANDS OF THE ANDES AND THE DESERT

Although Spain could not hold her overseas possessions against the wave of independence that swept over all the Americas, she left an indelible impression upon their religion and architecture.

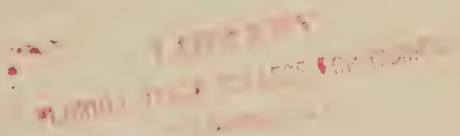
CARPENTER'S WORLD TRAVELS

LANDS OF THE ANDES
AND THE DESERT

BY
FRANK G. CARPENTER
LITT. D., F. R. G. S.



WITH 104 ILLUSTRATIONS
FROM ORIGINAL PHOTOGRAPHS



GARDEN CITY NEW YORK
DOUBLEDAY, PAGE & COMPANY
1926

~~718~~
~~Carpenter~~

F
2216
.C28
1924

COPYRIGHT, 1924, BY CARPENTER'S WORLD
TRAVELS. ALL RIGHTS RESERVED. PRINTED
IN THE UNITED STATES AT THE COUNTRY
LIFE PRESS, GARDEN CITY, N. Y.

ACKNOWLEDGMENTS

IN THE publication of this volume on my travels in Colombia, Ecuador, Peru, and Bolivia, I wish to thank the Secretary of State for letters that have given me the assistance of our official representatives in those republics. I thank also our Secretary of Agriculture and our Secretary of Labour for appointing me an honorary commissioner of their departments in foreign lands. Their credentials have been of great value, making accessible sources of information seldom opened to the ordinary traveller.

I acknowledge also the assistance and coöperation of Mr. Dudley Harmon, my editor, and of Miss Josephine Lehmann and Miss Ellen McB. Brown, associate editors, in the revision of the notes dictated or penned by me on the ground.

While most of the illustrations in CARPENTER'S WORLD TRAVELS are from my own negatives, those in this volume have been supplemented by photographs from the Colombian Government Information Bureau, the Pan American Union, the Guayaquil and Quito Railway, the United Fruit Company, W. R. Grace & Company, Arthur Dubois, W. Duval Brown, A. A. Hauff, the Publisher's Photo Service, and Ewing Galloway.

F. G. C.

CONTENTS

CHAPTER	PAGE
I INTRODUCING A CONTINENT	1
II FROM PANAMA TO THE EQUATOR . . .	7
III A MODERN CAVE OF ALADDIN . . .	18
IV GUAYAQUIL	25
V A LAND OF CACAO	35
VI THE CAPITAL OF ECUADOR	45 ✓
VII THE HEAD-HUNTING JIVAROS . . .	54
VIII DOWN THE DESERT COAST OF PERU . .	64
IX THE CITY OF PIZARRO	75
X IN THE SHOPS AND MARKETS OF LIMA .	84
XI ON THE WORLD'S HIGHEST RAILROAD .	93
XII CERRO DE PASCO	104
XIII AMERICAN INDUSTRY IN THE HEART OF PERU	112
XIV BY ROLLER COASTER DOWN THE ANDES .	120
XV AREQUIPA, CITY OF THE STARS . . .	127
XVI FARMING IN THE LAND OF THE SKY . .	136
XVII THE ANCIENT CAPITAL OF THE INCAS .	145
XVIII THE CUZCO OF TO-DAY	156
XIX STORIES OF BURIED TREASURE . . .	165
XX SLAVES OF ALCOHOL AND COCAINE . .	174

CONTENTS

CHAPTER	PAGE
XXI ON LAKE TITICACA	186
XXII THE TIBET OF SOUTH AMERICA	194
XXIII SUNDAY IN LA PAZ	202
XXIV THE FIRST CITY IN AMERICA	214
XXV THE AYMARÁ INDIANS	223
XXVI FROM LA PAZ TO ORURO	232
XXVII THE GREAT TIN MINES	240
XXVIII DOWNSPOUTS OF THE PLATEAU	252
XXIX THE BACKWOODS OF BOLIVIA	264
INDEX	275

LIST OF ILLUSTRATIONS

Overlooking a Spanish patio	<i>Frontispiece</i>
	FACING PAGE
In a Lima park	6
The harbour of Cartagena	7
The city of Bogota	14
Loading a river boat	15
On the government air line	15
The world's greatest emerald mines	18
A Colombian waterfall	19
Donkey freight carriers	22
Race track in Guayaquil	23
Bamboo houses	30
A banana raft	31
Drying cacao	34
Cacao harvesters going to work	35
Farms on the mountainsides	38
Mount Cotopaxi.	39
Balsa wood	39
The "Devil's Nose"	46
Church in Quito	47
Dried human head	54
Indian hut in the interior	55
Begging in a railroad station	62
A travelling sand dune	63
Fish peddlers meeting a steamer	70

ILLUSTRATIONS

	FACING PAGE
Irrigating the desert	71
A unique landing arrangement	74
In the city of Pizarro	75
Woodwork carved by the Indians	78
In the Plaza de Armas	79
Mounted constabulary	82
Peruvian Senate Chamber	83
Business street in Lima	86
Indian fruit peddler	87
In the harbour of Callao	94
The world's highest railroad	95
Indian shepherd woman	98
Crossing the Viscas Bridge	99
Suspension bridge in the interior	102
Native mother and baby	103
Street in Cerro de Pasco	110
Children mine workers	111
A power plant in the Andes	118
Patio process of ore treating	119
"The Little Hell"	126
Weird rock formation in the Andes	127
Ships anchored off Mollendo	130
On the road to Arequipa	130
Old Arequipa	131
The Harvard Observatory and Mount Misti	134
Juliaca	135
A llama train	142
Farms in the Cuzco Valley	143
The fortress of Sacsahuaman	146
Inca masonry	147
Stone seats overlooking Sacsahuaman	150

ILLUSTRATIONS

	FACING PAGE
Spanish torture block	151
Walls built by the Incas	158
The Cathedral of Cuzco	159
Shopping in the <i>portales</i>	162
Street scene	163
Ruins of an Inca temple	166
A toboggan slide of the ancients	167
Quichua water carrier	174
Native pottery	175
Vegetables "by the pile"	175
Market day on the plateau	178
A native loom	179
Indians and their llamas	179
Voting in Peru	182
Farms along Lake Titicaca	183
Islands in Lake Titicaca	190
Native balsas	191
The world's highest capital	198
Residential street in La Paz	199
Glaciers of Mount Illimani	206
A street merchant	206
A <i>chola</i> in her "Sunday best"	207
Climbing a La Paz street	210
A strange cemetery	211
An ancient doorway	214
A hut of Tiahuanaco	215
Chulpa mummies	222
A prehistoric stone figure	223
An Aymará Indian	226
Coca chewing recess	227
An Indian school	230

ILLUSTRATIONS

	FACING PAGE
A native festival	231
Weaving a poncho	231
Scene in Oruro	238
<i>Chola</i> business woman	239
Sacks of tin ore	242
Primitive ore crusher	243
Lakes of borax	243
Balconied street in Potosi	246
A mountain of silver	247
Road through the mountains	254
A railway refreshment stand	255
Bolivian wood cutters	255
On a motor highway	258
Indian raftsmen	259
Backwoods Bolivia	262
Gathering coca leaves	263
A native wedding ceremony	270
Indian brave in holiday costume	271

LANDS OF THE ANDES
AND THE DESERT

LANDS OF THE ANDES AND THE DESERT

CHAPTER I

INTRODUCING A CONTINENT

SOUTH AMERICA! The words make my blood tingle. Of all the six continents I have visited, there is none that breathes more of adventure, of romance, of history, of rapidly increasing development, and of great opportunity. In the varied features of the land and its peoples, it is a whole world of possibilities.

And what a world it is! I saw it first twenty-five years ago when I travelled the wilds in small boats, on mule-back, and on foot. I have since traversed many of the same routes in comfortable trains. During that first trip the Chilean transcontinental railway across the Andes was not yet completed, and to go from Valparaiso to Montevideo I went on a small steamer several thousand miles out of the way via Smyth's Channel and the Strait of Magellan. Now there are several railroads connecting the Atlantic and the Pacific, and two days will carry one from Santiago de Chile to Buenos Aires, Argentina. In that first trip I had to sail from the mouth of the Paraná to Rio de Janeiro, from where a coastal steamer carried me lazily on to the mouth of the Amazon. There are now

LANDS OF THE ANDES AND THE DESERT

railways crossing Uruguay and Brazil to Rio. It is the same in other parts of the interior of South America. Railways are opening up the eastern foothills of the Andes, and my last journey to the heart of Paraguay was made over a highway of steel.

While slowly but surely a network of rails is enclosing the continent, above it have sprung into being multitudinous airplanes, which vie with the condor and other birds in their flight. Twice every week passenger planes make the trip up the Magdalena River of Colombia to Bogotá, the capital. Passenger and mail planes flying between Buenos Aires and Montevideo, the capitals of Argentina and Uruguay, have brought those two great cities of Atlantic South America within less than two hours' ride of each other, a saving in time of ten or twelve hours. Quito and Lima, the capitals of Ecuador and Peru, miles above sea level, will be on the air routes of the near future. The Andes have been flown over again and again, and South America, from the Atlantic to the Pacific, will soon be covered by a fleet of aerial mails.

In all my travels in South America I have been continually amazed at the extent of the continent and the magnificent distances of its ten republics and three colonies. The Isthmus of Panama is farther from the Strait of Magellan than the distance from Los Angeles to Yokohama, Japan, and the continent, where it is widest, is five hundred miles farther across than from Cape Cod to the Golden Gate.

North America is larger in area than South America, but our continent has also more waste land. Its mighty heart is the Rocky Mountain plateau, a desert region that extends from Alaska to Central America, and our great

INTRODUCING A CONTINENT

northern bulge is covered with snow and ice a good part of the year. South America, as the merchant would put it, is a yard wide and almost all wool. The Andes form a lean strip at the west, and from them vast plains and plateaus reach far east to the sea. There are great patches of fertile irrigated lands along the Pacific, and the mighty plains that slope down to the Atlantic manywheres rival the valleys of the Nile and the Ganges in their potential productivity. The continent has, all told, one eighth of the land upon earth, and the greater portion of it is still to be conquered by man.

The size of the South American republics astonished me. Some seemed mere spots on the map, but I found Ecuador bigger than either Germany or France; Paraguay is more than equal to two South Carolinas; and Bolivia could hold fifty Belgiums, or two states as big as Texas, and have room to spare. Argentina has one third as much land as the forty-eight United States, and you can hardly put your foot down on a spot that will not raise grass or grain. The long shoestring of Chile, if cut up into squares, would more than equal seven states as big as Ohio, Virginia, or Kentucky. We think of Brazil as a far-off country of minor extent from whence come coffee and rubber, but it is so big that it could cover the main body of the United States like a blanket and have enough land left over to tuck in ten Maines under the edges.

All this vast territory is still in the making. Our discoveries in sanitation while building the Panama Canal showed that man can conquer the tropics, and the vast valley of the Amazon may yet become a region of cultivated farms. Central, southern, and eastern Brazil lie in a great plateau that will produce grain, coffee, cotton,

LANDS OF THE ANDES AND THE DESERT

and sugar, besides pasturage for cattle. The Paraná basin, including Paraguay, Uruguay, and Argentina, is potentially the richest meat and bread basket on earth. The same might also be said of the eastern slopes of the Andes and the irrigated valleys bordering the Pacific. Even the lands at the Strait of Magellan, a thousand miles nearer the South Pole than the Cape of Good Hope, have a climate so mild that cattle feed out of doors there all the year round and sheep have populated the islands adjoining.

As to minerals, since the days of Pizarro South America has been the El Dorado of gold and silver and of emeralds and diamonds as well. It has now become the continent of tin, copper, and iron. Under the famous silver mines of Cerro de Pasco, Peru, I saw an American company mining great beds of copper, and in Bolivia watched the Indians breaking up ore that was almost pure tin. Nearly half the tin of the world comes from Bolivia. On the coast of Chile is an iron mountain from which an ocean caravan of steamers is carrying ore north to the mills of the Bethlehem Steel Company, and on the highlands of Brazil are deposits of iron comparable to ours about Lake Superior. In every way the South American continent is fast growing in wealth. Its development is being carried on largely with money furnished by us. Since the World War we have bought more than six hundred million dollars' worth of South American government bonds, and our investments in all sorts of enterprises in those countries amount to more than three thousand million dollars. Our trade with our sister continent is rapidly growing.

I have found the peoples of South America of intense human interest. The white man who governs the coun-

INTRODUCING A CONTINENT

cry has all the feeling and the courtesy of the Spaniard. He is awaking to modern conditions and is responding to the spirit of twentieth-century progress. South America has always had more Indians than ever lived in the lands we possess, and to-day they are numbered by millions. They populate the highlands of the Andes and are found in the wilds of the Amazon. Some of them are savages whose favourite trophies are the heads of their enemies, cured and dried to a turn.

In the North I travelled among the descendants of the Chibchas, who centuries ago had farms and houses and an organized government, and in the Far South I saw the remains of the Araucanians, Indians who were so brave that the Spaniards had to leave them unconquered. Between the two are the Quichuas and the Aymarás. The Quichuas were ruled by the Incas. They built houses and temples, they wove cloth and wrought in gold and silver, and they watered their fields from irrigation canals hundreds of miles long. The Aymarás were also more or less semi-civilized. Both of these nations are now practically the slaves of the whites. Their present condition is described in these travels, as is also that of the more savage Indians found on the eastern slopes of the Andes. Farther over in the basins of the Paraná and the Amazon are the gentle Guaranis, who have intermarried with the whites and have become largely civilized.

The travels of this book cover only the northwestern part of the continent. Most of our time will be spent on the high plateau of the Andes, which, upheld by two great ranges, once was the home of the great Inca civilization. We shall visit also the tropical lands to the east that slope down to the Orinoco and the Amazon, and shall

LANDS OF THE ANDES AND THE DESERT

pass through the great desert that, with its valley oases populated by whites, runs for two thousand miles from north to south along the western coast of South America, backed by the thirsty walls of the Andes.

The countries included are Colombia, Ecuador, Peru, and Bolivia, all of which are of perennial interest to me, and which I hope will have a like place in the minds of my readers.



Like other South American capitals, Lima has its beauty spots that testify to the culture and taste of a people who came to America a century before the city of Boston was founded.



Colombia is the only country of South America that has ports on both the Atlantic and the Pacific oceans. Cartagena, on the north coast, is an important point of export of balsam, rubber, coffee, and cacao.

CHAPTER II

FROM PANAMA TO THE EQUATOR

I AM seated on the deck of a little Peruvian vessel steaming along the western coast of Colombia only a few degrees north of the Equator. We left Balboa two days ago, going out as the sun was setting over the fortifications on the islands of Flamenco, Perico, and Naos, which guard the Panama Canal, and turning southward when not far from Taboga. We are now in the doldrums, the zone of equatorial calms, where there is so little wind that north-bound sailing vessels are hardly able to reach the Canal. The air is almost still and would be stifling were it not for a slight breeze from the northeast trade winds.

The sea appears to steam; it is a vast expanse of molten silver, rippled now and then by the light winds that transform it into an undulating sheet of diamonds, rising and falling under the tropical sun. Here the Pacific is widest, its waters stretching westward for almost ten thousand miles before they reach Asia. This great ocean contains nearly half of all the salt water on the globe.

Our steamer belongs to a company subsidized by the government of Peru, and its fuel comes from the desert oil fields of that country. It can make sixteen knots and it moves over the quiet sea without perceptible vibration. Especially constructed for travel in the tropics, its cabins have large windows and doors opening on the deck. They

LANDS OF THE ANDES AND THE DESERT

are seldom closed except in bad weather, and one can sit in his room as though upon a porch and look far out over the ocean.

The meal hours are strictly Latin American. They begin with *desayuno*, which is a cup of black coffee and a cracker served in the cabin on rising. At eleven, in the dining salon, comes *almuerzo*, or breakfast, consisting of soup and fish, steak or eggs, and bananas or oranges. At four o'clock in the afternoon we have tea, and at seven a table-d'hôte dinner. The cooking is Spanish, the bills of fare are printed in that language, and the waiters are natives of South America.

We carry a supply of live meat with us, and I awake every morning thinking I am on my mountain farm in Virginia. There is a bleating of sheep, a crowing of cocks, and a quacking of geese and ducks. Now and then a cow moos or a pig squeals. On the upper deck within ten feet of where I am writing are two big coops full of chickens, ducks, and geese. The coops are two-story affairs walled with slats. The chickens are in the top story, some roosting and others poking their heads out to get at the water and corn in the troughs outside. The ducks and geese are in the compartments below. A little farther over are crates filled with potatoes and onions, and others containing oranges and pineapples. The sheep and cattle are in pens and stalls two decks below.

If one of our sea-going cows should take it into her head to jump overboard, and succeed in swimming to shore, she would land on the west coast of Colombia. Our boat does not touch at any Colombian port on this trip, but I can tell you a good deal about that country, and can give you a bird's-eye view of it as we steam south through

FROM PANAMA TO THE EQUATOR

the placid sea. Colombia occupies the northwest corner of South America. From north to south it is cut by the three mighty ranges of the Andes, known as the Western, the Central, and the Eastern Cordilleras. Between those ranges are fertile valleys, and east of them are grassy plains, or *llanos*, sloping down to the Atlantic. It is a land of every climate, from the tropical to the frigid, and it has a plant and animal life similarly varied. The region about Bogotá, the capital, eight or nine thousand feet above sea level, has a temperature throughout the year like that of New York in May.

That great table-land was once the home of the Chibchas, an Indian race that ranked with the Aztecs and the Incas in their civilization. They numbered more than a million and governed a territory as large as the combined areas of Belgium and Holland. Some of them were found even as far north as the Isthmus of Panama. At the height of their power and progress they irrigated land for farming, wove cotton into cloth, and had a knowledge of how to make utensils and ornaments of gold. Although they resisted the Spaniards for a long time they were finally conquered, and to-day only a few members remain of their once mighty tribes.

Colombia is the only South American country fronting on both the Atlantic and the Pacific oceans, and thus has especial natural advantages for trade with the United States and the rest of the world. It has a coast line of almost five hundred miles on the Pacific and more than six hundred on the Caribbean Sea. From south to north its territory is longer than from New Orleans to St. Paul, and from east to west it is wider in some parts than from Baltimore to Chicago. All our Atlantic coast states, with

LANDS OF THE ANDES AND THE DESERT

Ohio and West Virginia added, could be packed easily within its borders. It is eight times the size of New York, ten times as big as Kentucky, and as large as Germany, France, Holland, and Belgium combined.

Colombia used to be much larger than it is now. It formerly included the territory of the neighbouring republics of Venezuela, Ecuador, and Panama. The first two broke away within twenty years after freedom from Spain was won in the early part of the last century. Panama became independent in the revolution of 1903, when the United States had made up its mind to build the Panama Canal.

The loss of Panama was keenly felt by the Colombians, and was for years the cause of great resentment against the United States. The people believed that not only had their country lost the great revenues incidental to the building and operation of the Canal but that their national honour had been assailed. Finally, in 1921, the United States Senate ratified a treaty that provided for the payment of twenty-five million dollars to Colombia in five annual instalments. With this money, the Colombian government established a new fiscal system in accordance with the best standards of the times, and was enabled to effect other improvements that will contribute greatly to her future progress and development. In view of the intense anti-American feeling that so long prevailed, it is gratifying to know that Colombia chose a commission of Americans to serve as her financial advisers in re-organizing the fiscal system.

The shortest distance between the northern shore of Colombia and the United States is not so great as that between Philadelphia and Chicago. Tampa, Florida, is as

FROM PANAMA TO THE EQUATOR

near Cartagena as New York is to St. Louis, and from that Colombian port to New Orleans is only four days of easy steaming. Barranquilla, near the mouth of the Magdalena River, is less than nineteen hundred miles from New York, and the trip can be made in five days. By way of the Panama Canal, ships from Boston can reach the west coast of Colombia by a voyage of a little more than two thousand miles.

The chief Pacific port is Buenaventura, which has a population of less than seven thousand, a large percentage of which is Negro. The town is built on an island at the head of Buenaventura Bay, and at the mouth of the Dagua River. It is three hundred and sixty miles south of Panama, and the first port of call for south-bound steamers from the Canal. Buenaventura is eight miles from the open sea, and with the completion of improvements planned or under way it will have a good harbour, with an anchorage space about a mile long and a half mile wide. It is proposed to build a new city, including water-works, a system of sanitation, and paving, that can accommodate fifty thousand inhabitants.

Buenaventura is the outlet for the great Cauca River Valley, one of the most beautiful regions of the South American continent. It has been called a giant patio in the midst of the high mountains enclosing it, and the traditional politeness of its people has given it the name of "The Land of the Gentle Yes." Beginning near the Ecuadorian boundary, it runs northward between the Western and the Central Cordilleras at an altitude of more than three thousand feet above sea level. The valley is almost as large as California and its soil is as rich as that of our Pacific coast states. With proper develop-

LANDS OF THE ANDES AND THE DESERT

ment it will be one of the most productive agricultural districts of the country.

A railway has been built from Buenaventura to Cali, the metropolis of the Cauca Valley. Cali is a city of thirty thousand or so. It has many picturesque old Spanish buildings, although in the business district they are being replaced by modern brick structures. This is the first stage of the journey from the Pacific to Bogotá. The road crosses a pass five thousand feet high, whence there is an easy grade down to Cali. At first this line was so lightly constructed that when a heavy rain came, lasting for days, the rails were washed away. A call was sent all over the country for pack mules, and thousands of these animals were used to carry the freight until another, and more substantial, railroad track could be laid.

The journey from Cali to Bogotá is now made by boat, horse or muleback, and rail. Although the capital is only seven hundred miles from Barranquilla on the Caribbean, and less than half as far from Buenaventura on the Pacific side, it has no through rail connection with either port.

In 1921 an air service was inaugurated from Barranquilla to Girardot and instead of the seven-day ride up the Magdalena River the trip may now be made in as many hours. From Girardot passengers may go on to Bogotá by rail or may continue the trip by air, and may even engage a plane for flights to Cali or other interior cities. A plane recently covered the distance from Girardot to Bogotá and back in twenty-two minutes, a saving in time over the railway trip of fifteen hours or more.

The pilots are former German army aviators, and a large part of the operating capital is German money.

FROM PANAMA TO THE EQUATOR

The machines are hydroplanes of the Junker type, and since the beginning of the service they have made the six-hundred-mile trip from the coast twice each week without mishap. The fat man and the one with heavy baggage find it most expensive, as fares are based on the weight of the passengers and their belongings. The average fare is about one hundred and fifty dollars a person, and the rate for mail about thirty cents a letter. Because it is in competition with the river steamboats, which charge more for the journey up the river than for that downstream, the air service charges more for the trip inland than for the passage down to the sea. The principal source of profit is in the transportation of currency. Money exchange rates in the cities of the interior always differ considerably from those of the ports, and formerly, when currency was sent from Bogotá to the coast towns, so much time was required for its transportation that the banks frequently sustained great losses in their transactions. The Department of War has established a national school of aviation to encourage the use of airplanes as a means of communication and transportation in Colombia.

The flight to Bogotá affords panoramic views of great beauty. Passengers look down upon a vast expanse of jungle plain, much of it thinly inhabited and still unexplored by white men. It is shut in at the east and the west by the Cordilleras, the snow-capped peaks of which are obscured from sight at a lower level by the clouds. The Magdalena River looks like a shining ribbon, and the stern-wheeler boat forcing its way up the current is a mere speck on its surface. The elevation makes the temperature pleasantly cool and gives a perspective of

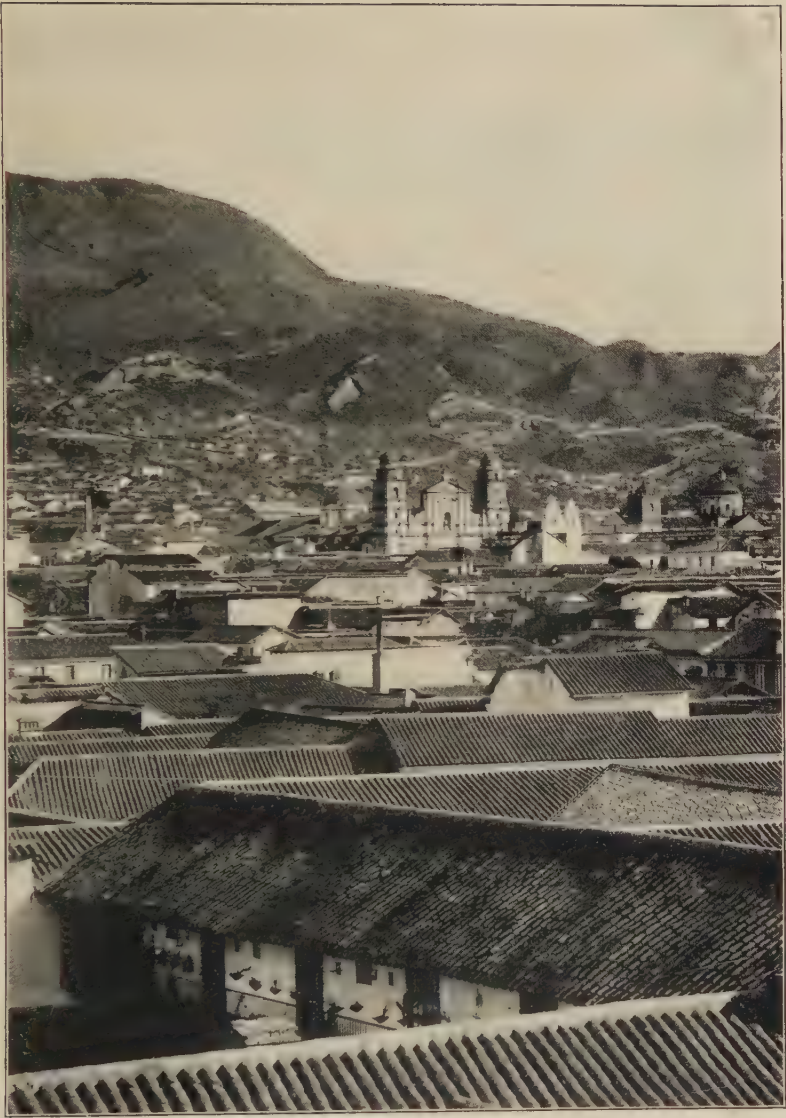
LANDS OF THE ANDES AND THE DESERT

mountains and valleys, icy peaks and steaming jungles, that brings a thrill to the most seasoned traveller.

Bogotá ranks so high as a centre of culture and education that it is sometimes called the "Athens of South America." It has numerous universities and colleges, including one founded in 1654. Next to that of Quito its astronomical observatory is said to be the highest in the world. The city has an opera house, museums, a national library, and polo, golf, and tennis clubs. There are fine stone buildings and many asphalt streets. In the shopping and business district one finds the typical crowds of the South American capital—well-dressed men, women fashionably gowned in Paris models or wearing black mantillas, and on every hand Indians and *mestizos*, or half-breeds, attired in all the colours of the rainbow.

A city was founded on the site of Bogotá by one of the several expeditions sent here by Spain in 1536 to conquer the Chibchas. Columbus had touched the Colombian coast in 1502 on his fourth and last voyage to the New World, and other Spaniards had carried on explorations, but comparatively little was known about the country. It was not until 1717 that it was made a viceroyalty of Spain, when it received the name of New Granada, and it was so called even after it proclaimed its independence from Spain in 1819. Although Colombia had a more or less stormy history for the remainder of the nineteenth century, it is now one of the only three countries in South America that have been without revolutions in the last twenty years. The other two are Argentina and Chile.

The agricultural resources of Colombia are but little developed. Its pasture lands may make it one of the



More than a mile high in the Andes, Bogotá has a cool, spring-like climate. It is one of only three South American capitals that have not witnessed a revolution in more than twenty years.



The rivers of Colombia are the main highways of trade, on which light-draft steamers and native dugouts do most of the transport business of the republic.



Passenger aeroplanes operated on regular schedules between Barranquilla and the capital have cut the seven-day trip from the coast to Bogota, by way of the Magdalena River, to as many hours.

FROM PANAMA TO THE EQUATOR

future sources of our meat supply, for the *llanos* sloping down to the Amazon and the Orinoco rivers could feed millions of cattle. The Cauca Valley, if extensively cultivated, could supply the chocolate markets of the world. In the interior and along the Caribbean Sea are regions suitable for coffee growing. The United Fruit Company has immense banana plantations in northern Colombia and exports millions of bunches from Santa Marta. In that district it has eighty thousand acres of land suited for raising bananas, sixteen thousand acres or more being already under cultivation. In addition, the total area on which this fruit is raised by individual growers is almost as large. Colombia's entire foreign trade in bananas is worth one million dollars a year. In the valleys and lowlands corn, sugar cane, rubber, and cotton also are grown. The Indians weave quantities of Panama hats from the straw of the *toquilla* palm, and ipecac is an important article of export.

One of the little-known and most interesting products of Colombia is the tonka bean, from which most of the perfume sold as sweet clover and new-mown hay is made. It grows on a tree from sixty to ninety feet high. The fruit of the tree is a pod that contains a single bean about an inch long and shaped like a large kidney bean. The odour of the tonka somewhat resembles that of vanilla and the bean is frequently used as an adulterant in making cheap vanilla extracts. Another use of the *tonka* is in the manufacture of tobacco. In bygone days every jar or box of snuff contained a tonka bean, and the flavour of some of our smoking tobacco is still enhanced in the same way.

The chief crop of Colombia is coffee. Colombia leads

LANDS OF THE ANDES AND THE DESERT

the world in the quality of her coffee and is second only to Brazil in the quantity produced. It is much used to mix with the cheaper Brazilian grades. The industry has grown so that the annual production has tripled in the last ten years, and the value of that now sold abroad amounts to one half of Colombia's entire export trade. Two hundred million pounds have been bought in one year by the United States, which during the World War became Colombia's best customer.

This republic is an undeveloped empire awaiting foreign capital to bring it to life. It will require, however, large investments and a willingness to await returns. Much of its wealth is in sparsely settled regions. The great need of the country is railroads, but it does not pay to build railroads until there is freight to be hauled, while production will not pay until goods can be delivered to a market at reasonable rates.

Colombia is eight times as large as our New England states, but has only one ninth as much railway track. Its total railway mileage is so small that if all the lines were joined together they would reach little farther than from New York to Chicago. The fact that there are three different gauges adds to the difficulty of developing a national railway system.

To-day the rivers of Colombia carry much of the freight. The Magdalena is navigable for almost a thousand miles, and through the Meta and other streams the interior is connected with the Orinoco and the Amazon, which reach the Atlantic through Venezuela and Brazil. The Sinu and the Atrato rivers have considerable traffic, and the Cauca, which flows into the Magdalena, gives outlet to the products of the lower part of the rich valley of that

FROM PANAMA TO THE EQUATOR

name. Before the Girardot-Bogotá air service was established, everything was carried from the Magdalena to Bogotá in ox carts and on the backs of men and mules, and in many parts of the country the mule is still the common carrier.

CHAPTER III

A MODERN CAVE OF ALADDIN

DURING colonial times Colombia was the chief gold-producing country of all the Spanish possessions in the New World, and was second only to Peru and Mexico in its entire mineral output. It was here that Balboa first learned from the Indians of the treasures beyond the mountains that were afterward seized by Pizarro. Since then seven hundred million dollars' worth of gold has been taken out of Colombia, and there are now more than eighteen thousand gold mines in the republic. The richest gold-bearing regions are in the Antioquia province and farther south in the ranges between the Cauca and the Magdalena rivers. In that area, which covers thousands of square miles, gold is said to occur wherever there is gravel. In the mountains, where the rock has been laid bare, are many quartz veins that require only modern methods to extract the metal in quantity, and in the department of Narino, bordering on Ecuador, gold nuggets are found in the beds of the rivers flowing into the Pacific Ocean.

Many of the mines of the Antioquia region have been worked continuously since before the arrival of the Spaniards. For centuries the natives have washed out the placer gold in wooden pans, or *bateas*. During the last decade or so English and American mining companies



Nearly all the emeralds in the world come from Colombia, where for centuries gangs of Indians have been getting out gem-bearing quartz from pits and terraces in the mountain sides.



A mountainous country of countless rivers, Colombia has almost unlimited water-power. With the increase in mining operations and the development of the cities, some of the streams are being dammed and put to work.

A MODERN CAVE OF ALADDIN

have installed modern dredgers, dams, and placer-mining equipment costing millions of dollars.

Nearly all the Indian tribes have more or less gold, which, like the rest of us, they try to keep. To make the Indians give up their hoards, sometimes the priests have set up images of saints supposed to cure diseases provided the supplicants made suitable offerings. If a man had a sore leg he moulded a leg of gold, the size of his little finger or larger, and presented it to the saint. If the afflicted member became well, the Indian was naturally convinced that the saint did the work and that the cure was worth what it cost.

Another story I hear is about the sacred Lake of Guatavita. That lake lies far back in the interior and high up in the mountains two miles above sea level. It covers a deposit of mud thirty feet deep, which is believed to contain gold images, gold plates, and gold dust, thrown there by the Indians as offerings to their gods. The ceremony was performed by the chief, who first took a bath in gold dust. He was then put on a raft loaded with gold and emeralds and rowed out to the centre of the lake, where his subjects washed the gold dust from his body and threw the other offerings into the water.

An enterprising Englishman conceived the idea of draining the lake to recover its hidden treasure. This was done after much labour and expense by driving a tunnel through a small hill on its shores. But when the water was drained off, the bottom of the lake was found to be a mass of liquid mud, making the work already done practically worthless. Nevertheless, long continued dredging in the ooze brought to the surface many valuable evidences that the old Indian tradition was not

LANDS OF THE ANDES AND THE DESERT

without foundation. At Panama I saw golden curios from Lake Guatavita, and I know that for many a year golden images were dug up from its shores.

Colombia has long ranked second in the world in the production of platinum. Indeed, during and after the World War, owing to the shutting off of supplies from Russia, this republic became the principal source of this metal, and a movement was started for mining it on a large scale. Practically the entire production, worth more than three million dollars annually, is exported to the United States.

The largest deposits of platinum are found in the western part of the country, near the head waters of the Atrato and the San Juan rivers. The several foreign companies that are operating there have done much to improve the healthfulness of those regions. Modern and sanitary camps have been established, the jungle undergrowth has been cut away, and large areas of land have been drained to lessen the danger from mosquitoes.

Europe first knew of the existence of platinum in Colombia when the Spanish traveller, Don Antonio de Ulloa, upon his return from an expedition to the New World in 1735, told of finding it there. A few years later several specimens of the ore were brought to England. They were found along the River Pinto, and were called "Platina de Pinto," platina meaning "little silver."

Platinum is always found with gold, and for years after it was first discovered in 1737 it was thrown away in gold-mining operations. When its value was realized, frantic efforts were made to recover it. In the town of Quibdo the earth of the streets and yards has been washed

A MODERN CAVE OF ALADDIN

to get out the discarded metal, and one man extracted nearly thirty thousand dollars' worth from around the foundations of his house.

Petroleum exists in many parts of Colombia, but at present the most promising fields are in the Magdalena Valley, along the Atrato River, and in the *llanos* toward the Venezuelan frontier. The oil often is found on the surface, seeping out through cracks in the earth. In Antioquia is an oil geyser that spouts a stream of petroleum twenty feet high. In parts of the tropical jungle are places where the natives collect crude oil, which they burn in earthenware lamps. The oil from the petroleum springs along the Sinu River is of sufficiently high grade to be used in an ordinary kerosene lamp.

The existence of oil in Colombia was until recently a matter of interest only to geologists, but the increasing use of petroleum products has led the principal oil companies of the world to acquire drilling rights on millions of acres of Colombian land. One of the largest American oil corporations has established a refinery at Barranca Bermeja on the Magdalena River, and is shipping kerosene and gasoline to various parts of the country. It has built large receiving stations along the river and plans to lay a pipe line to the coast as a means of getting the oil to foreign markets. The petroleum deposits will probably not be developed to their fullest extent, however, until a change is made in the present laws of the republic, which are now designed to protect national rights rather than to attract foreign capital.

In addition to its untold wealth in precious metals, Colombia now produces practically all of the world's supply of emeralds. From earliest recorded times these

LANDS OF THE ANDES AND THE DESERT

gems have been regarded as even more valuable than diamonds. They were formerly believed to have supernatural powers and were supposed to drive away evil spirits from the owners. Some of the ancients thought that looking at an emerald benefited the eyesight. Other powers attributed to the gem were giving the wearer eloquence of speech, exposing falsehoods, and making snakes blind.

The emerald mines of Colombia have been famous for many centuries. They belong to the State and are worked through concessions or leases. Individuals are prohibited from claiming any gems they may discover, unless they hold permits to work the deposits and pay a heavy royalty to the government. No stranger is allowed to approach the mines without permission from the Minister of Finance, under whose jurisdiction they are placed, and labourers are carefully searched before being allowed to leave the property.

The most important mines are those of Muzo, about ninety miles north of Bogotá. They are located in a dense jungle of the Central Cordillera, miles from any settlement, although the remains of two cathedrals and several other buildings indicate that there was once a large city there. The mines are protected by a dozen guard houses on hills overlooking the workings. The precious stones are found in the bowl of an extinct volcano. They are dug out by Indians, who break up the rock along the terraced hillsides, uncovering the trail of green quartz containing the crystals. This quartz is taken out with great care, and after the emeralds are removed the débris falls into a sluiceway where it is washed off by water dropping from the higher levels of the mine. After



With only about one thousand miles of railroads, overland freight in Colombia is carried mostly on muleback, over roads that have been but little improved since the days of the Spaniards.



The citizen of Guayaquil, like nearly all Latin Americans, has a strain of sporting blood in his veins and dearly loves a horse race. In some cities racing is becoming more popular than the bull-fight.

A MODERN CAVE OF ALADDIN

the water is drained away the gravelly sediment is again searched for gems.

The Duke of Devonshire, the most valuable emerald known, was found in such gravel. This stone was about two inches long, two inches thick, and weighed a little more than a half pound. Another famous gem, the Hope emerald, also came from Colombia. Its weight was six ounces. There is a tradition that Cortes got from the Aztecs an emerald worth forty thousand ducats, and that another the size of an ostrich egg came from Peru, where the Indians worshipped it as a goddess.

The Colombian mines were first worked by the Indians before the arrival of white men in South America. After the conquest by the Spaniards, the natives were driven into tunnels in the hillsides and forced to dig for emeralds. On account of the underground dampness and cold, they usually died within a few months or a year. Food was thrown to them as long as they produced emeralds, but if they failed to find any gems they were allowed to die of starvation.

Later, many of the mines were abandoned and remained hidden in the jungle for more than a hundred years. They were rediscovered near the end of the nineteenth century. Until a few years ago the skeletons of the victims of the cruel treatment of the Spanish conquerors were still being dug up in the new workings. To-day the Colombian government gives the miners every reasonable comfort, and if it were not for the unhealthy climate they would be well off.

The Muzo group of mines has yielded eight hundred thousand carats of emeralds in a year, of which about one third are first class, more than one half second class,

LANDS OF THE ANDES AND THE DESERT

and the remainder of lower grades. Recently the output of many rich mines has been kept down to prevent over-production and a glutting of the market.

Coal exists in almost every part of Colombia, copper is found in large quantities, and there are vast untouched deposits of iron, tin, lead, and nickel. Under Spanish rule the mines were exploited by slave labour, and when the despotic power passed away production was limited to the supply of domestic needs. It is only within recent years that modern progress has roused Colombia, like a sleeping princess, to arise and gather up her jewels.

CHAPTER IV

GUAYAQUIL

THE city of Guayaquil! How shall I describe it? It is one of the strangest places in the world. The chief gateway to the republic of Ecuador, it lies seventy miles up the wide Guayas River, and is almost on the Equator. It is frowned upon by the snowy peaks of Chimborazo and Cotopaxi, the latter the highest active volcano in the world, and it is bathed in the moist, miasmatic air of the tropics. Seen from the river, it reminds one of Venice along the Grand Canal; upon the wharves the scenes make one think of Naples; while its business sections include a maze of bazaars like those of Cairo, Calcutta, or Bombay, as well as broad streets lined with the plate-glass windows of modern stores.

The people are of many types. Well-dressed men and women pass to and fro, workmen labour at their trades in the open, and porters carry bales and bags on their backs. Everywhere we see piles of cacao beans drying in the sun, stirred now and then by the feet of half-grown youngsters.

When I was here before, Guayaquil had hundreds of donkeys. I saw one with a load of boards strapped to its sides so that it looked as though it were walking between walls of pine planks, and another with panniers containing loaves of bread slung across its back. To-day on those streets automobiles and motor trucks are speeding by.

LANDS OF THE ANDES AND THE DESERT

Their use has increased rapidly since the cobblestones have been removed and the streets paved with asphalt.

Guayaquil to-day is in every respect a well-ordered city, and has a good police force. On a former visit I was kept awake during my first few nights here by the policemen shouting that they were awake. Every man on watch was required by regulation to cry out or whistle at intervals of a quarter of an hour. The cry was: "*El sentinel es alerta*," and the whistle was a combination more wonderful than anything except the noise of the Guayaquil frogs, which screamed out "hi-hi-hi" all night long. One of the policemen almost dropped his gun on my foot one day as I attempted to pass behind him. I afterward learned that a person was supposed to pass in front of a policeman and not between him and the wall. Another regulation in force during times of revolution was that all persons out after eleven o'clock in the evening had to be prepared to give an account of themselves. The challenge was: "Who goes there?" and if your answers did not satisfy the police you were taken to jail.

In coming to Guayaquil, I entered the estuary of the Guayas River just opposite the island of Puna, on which Pizarro landed on his way south to conquer Peru. With most of his men he had landed farther north and proceeded southward by overland marches, his vessels following him just off the coast. Many of his soldiers were landed on the island by means of the native rafts of balsa wood. The Indians of Puna at first accorded the Spaniards every hospitality, but later hostilities broke out, and hundreds of men were slaughtered. Finally, with the arrival of two more vessels carrying reinforcements of men and horses, Pizarro left the island and landed on the





GUAYAQUIL

mainland again at the port of Tumbez near the present boundary between Peru and Ecuador.

Some of the largest vessels anchor here, discharging their passengers and cargoes in lighters. Our steamer drew less than twenty-two feet of water and so we could go on up the river. Skirting the island, we came into the Gulf of Guayaquil, which forms the mouth of the river. The estuary is six miles wide at this point, and as we steamed along we seemed to be passing through an inland sea. The water was of the colour and the thickness of yellow pea soup. It was spotted with patches of green—great trees and other débris from the Andes being carried down to the sea.

At Guayaquil the river is wider than the Mississippi at St. Louis. It furnishes a safe harbour and is usually filled with craft of all kinds, from ocean-going steamers to the dugouts, rafts, and cargo boats used by the Indians. The wharves are crowded with men and women who have brought fruit and other things to sell. Among their wares are papayas, or melons that grow on trees. In size and in their rich yellow meat they seem much like our muskmelons. The thin-skinned, juicy Ecuadorian oranges are as sweet as any I have ever tasted, and the pineapples from the hot coast lands sometimes weigh as much as twenty-five pounds.

Many of the Indians have for sale Panama hats, hundreds of thousands of which are woven by hand each year by the natives. The quality and style vary according to the locality from which they come, but even the very best are sold at much lower prices than in the United States.

The Guayas is to South America what the Columbia is

LANDS OF THE ANDES AND THE DESERT

to North America. It is the largest river on the western side of the continent, and the outlet of the great network of streams that flow down from the Andes. During the rainy season from December to May, they convert much of the country into a vast lake. Then boats like those on the Ohio or the Mississippi can travel two hundred and fifty miles farther inland from here. They make the rounds of the villages and the plantations, and bring out cacao, ivory, nuts, sugar, coffee, and rubber. Nine tenths of all the foreign commerce of Ecuador passes through Guayaquil, and since the improvement of the port its traffic is steadily increasing. The opening of the Panama Canal brought the city within only eight days of New York and stimulated trade with the United States. We now furnish more than half the imports of Ecuador, and take three fourths of its exports. We supply most of its cotton goods, and compete with Great Britain in the sale of machinery and woollens. We lead in selling it boots and shoes, and also lard, wheat, flour, and coal.

When I first visited Guayaquil it was a town of forty thousand inhabitants. It has now one hundred thousand people or more, and with its growth has acquired electric lighting and street-railway systems. It has a university, a theatre, and several moving-picture houses. Indeed, our "movies" are very popular here, and though most of the streets are deserted at night, there are always crowds in the neighbourhood of a "movie" theatre. The streets of Guayaquil have been widened and many modern buildings erected. Some of them are of two or three stories, covered with stucco, and painted all the colours of the rainbow. Many of the older buildings have balconies that extend out over the street, and not a few have galleries

GUAYAQUIL

along the second story. The balconies are walled with windows through the half-closed shutters of which there may be dark-eyed beauties looking down upon us as we pass by.

The city has several banks, sugar mills, rice factories, and coffee hullers. There are large stores filled with fine goods, and great warehouses stacked high with bags of cacao, coffee, and sugar awaiting shipment. Cables connect Guayaquil with all parts of the world. It has telephone service with long-distance connections with Quito, almost three hundred miles away in the Andes. One of Guayaquil's newspapers, *El Telégrafo*, inaugurated an airplane service to Quito mainly for the quick delivery of newspapers to the capital city. A military aviation school, with Italian pilots as instructors, has been established in the province of Guayas. A French syndicate has a thirty-year concession for the operation of the telephone, the telegraph, and the radio systems of Ecuador. The government pays the company an annual subsidy of at least two hundred and fifty thousand dollars, and shares in any profits that may be made.

The eradication of yellow fever, malaria, and other contagious diseases in Guayaquil was one of the great achievements of the twentieth century in the field of sanitation. This city long had a death rate higher than that of any other place in the world, and was known all over the globe as "the pest hole of the Pacific." Because of the almost continual presence of yellow fever, malaria, and even the bubonic plague, this port was dreaded by shipping men, and was regarded as a menace to the success of the Panama Canal. During the rainy season the town used to be flooded with stagnant water, which the authori-

LANDS OF THE ANDES AND THE DESERT

ties were so afraid of stirring up that it was against the law to drive a cart or carriage through the streets without a special permit from the police. Winter was the most dangerous season of Guayaquil—the season of yellow fever and malaria—when death hovered over the town and the doctors made enough money to pay for summer vacations in Europe. The water lay all about in pools upon which floated a thick coat of green slime. In summer, the unpaved streets were filled with dust, and the donkeys wore pantalets to protect them from the bites of gadflies and mosquitoes.

In the great yellow fever epidemic at Panama in 1905 it was thought that the infection came from Guayaquil, although the Ecuadorians say this is not true. The spread of the disease cost the lives of some of the officials in charge of building the Canal. I was at Panama several weeks during the height of the epidemic, and frequently, after having had dinner with a man, I would hear a few days later that he had been stricken, and perhaps a week later that he was dead.

Another danger at Guayaquil was from malaria, which, you will remember, caused so many deaths on the Isthmus at the time of the building of the Panama railroad. This the Ecuadorians call *perniciosa*, and it is known to the Panamans as Chagres fever. I once experienced a severe attack of it in this part of the world. Guayaquil was avoided by ships also because of the bubonic plague, which first broke out here in 1908. The moment a traveller landed he was grabbed by the doctor and a plague serum injected into his arm. He then was given a certificate showing that he had been vaccinated, and he had to produce this before he was allowed to go into the interior.



In the older portions of Guayaquil many houses have walls of split bamboo, with removable sections. The more modern buildings are made of wood and covered with plaster in imitation of stone.



Products of Ecuador's forests and farms are rafted down the rivers tributary to the Guayas, which affords the chief outlet for the commerce of the country.

GUAYAQUIL

The towns swarmed with rats, the fleas from which carried the plague. Most of the houses stood close to the ground and had wooden floors under which the rats could burrow.

During my travels in China and India I have encountered many epidemics of bubonic plague. I visited Hongkong and Canton when the people were dying at the rate of so many hundreds a day that sixty thousand coffins had to be furnished by charitable associations to bury the dead. The plague in China was spread by rat fleas, and it raged with devastating fury in the densely built warrens of the Chinese at Hongkong. It was this plague that broke out in Europe again and again in the years between the sixth and the eighteenth centuries, and is said to have caused more deaths than any other epidemic that has populated the graveyards of man. This also was the pest that Daniel DeFoe described in his story of the great black plague in London of 1665 and 1666. The terrible infection is believed to have been spread over the world from China.

The work of cleaning up Guayaquil was begun under the direction of General William C. Gorgas, the United States Army surgeon who made Havana and the Canal Zone safe for Americans. It was brought to a successful completion in coöperation with the Rockefeller Foundation. Millions of dollars were spent, and the city was almost rebuilt. The docks and wharves, where countless rats lived, were torn down and new ones constructed, and drains and sewers were laid to carry away the stagnant pools, the breeding places of the *Anopheles*, or malaria mosquito. A water system was installed, and water is now piped from the mountains, fifty-three miles away, to a reservoir on one of the hills north of the city.

LANDS OF THE ANDES AND THE DESERT

The *Stegomyia*, or yellow-fever mosquito, unlike the *Anopheles*, does not like dirty water, but is fond of rain barrels. Experiments showed that certain kinds of fish would eat the larvæ of this mosquito, and a law was passed requiring that at least one fish be kept in every rain barrel or other small water container. This regulation, together with the screening or sealing of the larger tanks, proved an effective means of eliminating the yellow-fever mosquito and thereby putting an end to the epidemics.

In the meantime, the scientists coöperating with the Ecuadorian government were successful in isolating the fever germ and producing a vaccine to fight the disease. This vaccine, administered before the third day after a person had been bitten by a yellow-fever mosquito, reduced the mortality from fifty-six to thirteen per cent., while people who had been twice vaccinated were entirely immune from contagion.

But before we leave Guayaquil let me tell you something about the republic of Ecuador. Its name means "Equator," and this land, called after the hot girdle encircling the waist of Mother Earth, lies wholly in the tropics. It forms a triangle on the west coast of South America, wedged between Colombia, Brazil, and Peru. Its shape is somewhat like that of a fan, with its handle in northern Brazil and its scalloped rim washed by the Pacific Ocean.

Ecuador is one of the least known of all the South American republics. Parts of it have never been surveyed, and estimates of its area vary from the size of California to that of Texas. The best authorities place it at one hundred and sixteen thousand square miles, which is about equal to Ohio, Virginia, and Indiana combined. Ecuador

GUAYAQUIL

and her neighbours have never been able to agree as to her boundaries, and there are maps showing six different frontiers.

The country is divided naturally into three distinct zones. Along the Pacific is the tropical coast region, next is the land of mountains and plateaus known as the Montaña, and east of the Andes are the vast stretches of almost unexplored territory called the Oriente. The coast lands are low, and tropical vegetation extends for about eighty miles back from the ocean to the foot-hills of the Andes. The mountains cross the country from north to south in two mighty ranges, upholding between them a series of beautiful valleys in which nine tenths of the people live. These valleys have a greater elevation above sea level than Mexico City and a climate like that of New York or Ohio in June. They are walled by some of the greatest volcanoes in the world. There are twenty-one volcanic peaks from three to four miles in height, and seventeen others more than two miles high. Ten of them are more or less active, and at times the air here at Guayaquil is filled with ashes from their eruptions. To withstand the occasional earthquakes, many of the houses are small and built of wooden timbers so joined together that they can sway with the trembling of the earth and not give way. ✓

The tropical wilderness of the Oriente extends to the tributaries of the Amazon, and some of Ecuador's streams flow into that mighty river. A railway from the plateau to one of the rivers emptying into the Amazon is planned. Such a line would open up a rich mining region and lands suitable for growing sugar cane, cacao, cotton, and coffee.

As in Colombia, the minerals of Ecuador have never

LANDS OF THE ANDES AND THE DESERT

been exploited to any extent. The Zaruma gold mines are important, and in Canar are large silver deposits. The highlands are known to be rich in coal, copper, iron, lead, and platinum, while sulphur exists on the slopes of Mount Chimborazo and in the Galapagos Islands. Salt is found in several provinces and mined as a government monopoly, and in recent years petroleum has been produced in increasing quantities in the oil fields of Santa Elena.



After the cacao bean is harvested it must be dried in the sun before being sent to the chocolate mills of the world. One fourth of the Ecuador crop, or about twenty-five million pounds, goes to the United States.



With machetes and knives fastened to long poles, the cacao harvesters gather the beans from which our chocolate and cocoa are made. This crop furnishes Ecuador's chief export commodity.

CHAPTER V

A LAND OF CACAO

I HAVE just returned from a visit to a town where to-day the streets are crossed by bridges and the housewives go to market in canoes. I started from Guayaquil in an American-built steamer for the river port of Bodegas, forty miles away at the foot of the Andes. Soon after leaving Guayaquil we passed the mouth of the Daule River and a few hours later came into the Bodegas River, the headstream of the Guayas. We sailed up that river all night and early in the morning came to anchor among the houses of Bodegas, which seem to float upon the water.

For most of the year Bodegas is the head of navigation of the Guayas, but now, during the rainy season, small river boats can go two hundred miles farther inland. The town has a population of five thousand, and is an important transshipping point between Guayaquil and the interior. It is located in a region rich in cacao, sugar cane, rice, and minerals.

When we arrived at Bodegas I was carried ashore on the shoulders of a half-naked Indian, and crossed from street to street on bridges of logs. In the lower parts of the town the houses are built on stilts, and in dry seasons the ground underneath is occupied by chickens, donkeys, and cattle. At the time of the floods these animals are

LANDS OF THE ANDES AND THE DESERT

kept in the houses with the people or upon rafts moored to the piles and rising and falling with the water.

Hundreds of the houses can be reached only in canoes, and the children go to school in boats. The poorer Indian homes consist of little more than one room about six feet square, usually ten feet above the ground, and reached by a ladder outside. The women do their cooking in clay pots over a charcoal fire built in a box filled with earth. The chief food is the potato-like tuber known as the yucca, and plantains or large bananas. Much rice is eaten; it is cooked with lard, most of which is imported from the United States.

There is no privacy whatever in these homes. Men and women, boys and girls, and wives and maidens all herd together, sleeping in the same clothes they wear during the day, and lying indiscriminately on the floor or in the hammocks. These hammocks, made of woven fibres, are not only the common beds of many of the Indians of Ecuador, but are also widely used in neighbouring countries. The usual bathroom is a floating shed with holes in its floor, through which one may dip himself into the river, with the possibility of losing a leg by the nip of an alligator.

The business section of Bodegas is on a strip of elevated land, so that the shops are free from water. Here the buildings are of wood, the larger ones two stories high, with cave-like stores on the ground floor and living quarters above. Pavements and other modern improvements are unknown, and there are neither gutters nor sewers. There is not a chimney in the town. Neither have I seen any glass windows, the second-floor rooms being ventilated by latticework around the ceiling. The

A LAND OF CACAO

front walls of the lower stories are movable, and are thrown back in the daytime so that, as in the houses of Japan, one can see all that goes on within.

I was at a loss to make myself understood in Bodegas, as my Spanish was lame. At last I learned that an American carpenter and undertaker named Klein lived there. I found him among his coffins. He left his work and together we went to visit one of the biggest plantations in Ecuador, the owner of which has great herds of cattle and horses and sells hundreds of thousands of pounds of cacao beans every year. Most of the country-side was under water, so we went to the plantation in a dugout about thirty feet long and about three feet wide. It was poled and sculled by two lusty, brown-skinned gondoliers, one of whom stood at each end. Mr. Klein sat in the bottom and I was given a place beside him and told to hold myself steady.

We were pushed along through the wide streets of water lined with floating huts, and on into the tropical forest. We glided among the treetops, now grazing a great black alligator and now chattered at by monkeys that made faces at us as they scampered away. The woods were full of strange birds which fluttered about with shrill cries as we passed. We had a shot at one, a beautiful creature the size of a pigeon, with a blood-red bill, long legs of golden yellow, and feathers of royal purple. I fired also at an alligator but the canoe rocked as I stood up, and the monster dived down unharmed. Mr. Klein told me that on the highlands he often bagged a deer and sometimes a jaguar or a wild hog, and that among the mountains were to be found all kinds of beautiful humming birds in great numbers.

LANDS OF THE ANDES AND THE DESERT

The trip was wonderfully beautiful. Under us was twelve feet of water, covering what a few weeks before had been dry land. The partly submerged trees formed a thick arbour of shade as we wound in and out among them. Now we moved along a narrow canal of green, and now out into a great foliage-walled chamber, where every branch was loaded with orchids—rare blooms that would be worth thousands of dollars in New York. There were insects everywhere, bugs and ants of every kind falling upon us as we floated onward. My companion told me that once a boa-constrictor dropped into his boat from the branches of a tree overhead.

In this dense tropical vegetation were rubber trees, trees loaded with alligator pears, and here and there a tall palm lifting its great head high over the forest. The silence was oppressive, the soft air heavy, and the lapping of the water against the sides of the canoe invited one to sleep. Occasionally a dugout containing an Indian family passed us, or a great cargo boat loaded with cacao moved by on its way to the market.

Nearly all the country over which we travelled was the property of the planter we were to visit, and most of it was flooded. Even the grazing lands of the plantation were under water, but the herds had been taken to the highlands at the foot of the Andes. We came upon the planter's house in a wide waste of waters, with the tops of fence posts sticking up above the surface. We paddled over the fences, passing tenant houses of bamboo thatched with palm leaves and built upon stilts. Under each house was a platform, just clear of the water, on which the family chickens and pigs lived within six inches of drowning. We passed a floating butcher-shop, went by



On the small farms lying in the narrow valleys below Quito, or clinging to the steep mountain sides, the fruits and vegetables of both the temperate and tropical zones are grown, for the climate is hot or cool according to altitude.



The world's loftiest active volcano is Cotopaxi, nearly four miles high. Sometimes its heat, by melting the snow on the sides of the peak, causes disastrous floods in the lowlands.



Because of its lightness, the wood of the balsa tree has become a competitor of cork. The Ecuadorians use the logs to make rafts, which they operate not only on the river but along the sea coast.

A LAND OF CACAO

a great barn on piles, made our way through a number of cacao boats, and sailed over the front gate up to the second-floor level of a large white three-story building surrounded by wide verandas.

The owner met us at the door. He ordered our boat tied to the veranda and invited us to come in and make ourselves at home. A moment later food and wine were placed before us. The daughters of the house were called in, and we drank to the better relations of our countries and continents. Later a servant was sent after fresh coconuts. We drained their sweet milk from the shell and then went out in canoes to look over the property.

From what I have learned in talking with the cacao exporters in Guayaquil, together with what I saw with my own eyes on that inundated plantation, I can tell you the whole story of the product without which we could not have chocolate candies to eat or cocoa to drink.

Until I came here I had an idea that the beans from which chocolate is made grew on bushes, and I was surprised to learn that they come from an evergreen tree that reaches a height of twenty or thirty feet, although it is usually kept lower by trimming. Its large glossy leaves are chiefly on the ends of the branches, but sometimes on the trunk. The pinkish-white blossoms and the short-stemmed fruit grow on the trunk and on the main branches. When mature the fruit is of the shape of a squash, usually six or eight inches long and six inches thick, and yellow or reddish in colour. It has a thick, hard, warty shell, inside which are light-brown seeds, or beans, which form the cacao of commerce. The beans are about as big as almonds and a little thicker. Each has a thin outer coating inside which is a dark-brown

LANDS OF THE ANDES AND THE DESERT

kernel. It is from the kernel that our chocolate is made. There are twenty or thirty and sometimes forty seeds in one fruit.

In raising cacao the seeds are planted in nurseries, and after the trees are a foot or more high they are transplanted, about two hundred and fifty being set out to the acre. At first they are shaded by banana plants to keep off the hot rays of the sun. The ground is thoroughly cultivated until the trees are five years old, when they begin to bear fruit. They continue to bear for twenty or thirty years. The average yield for a tree is about three pounds of beans a year, although some trees produce more. Five or six hundred pounds to the acre is considered a good crop.

The fruit is harvested by being cut from the trees with sharp knives fastened to long poles so as to reach high above the ground. Later the seeds are taken out, dried in the sun, and shipped to the market. Cacao is the principal agricultural product of Ecuador, and constitutes eighty per cent. of its export trade. This country is out-ranked only by Brazil and the Gold Coast of Africa in the amount of cacao it produces every year. The total area of its cacao plantations is more than three hundred thousand acres, and the annual crop amounts to almost a hundred million pounds. Practically all of it is exported and one fourth goes to the United States.

Some years ago a number of leading cacao growers and business men here founded the Agricultural Association of Ecuador, a body similar to our rice and cotton growers' organizations in the United States. The Association is authorized by the government to collect a tax of fifty cents gold on every one hundred pounds of cacao exported.

A LAND OF CACAO

This money is applied to a fund that is used to better working conditions, for experiments to improve the quality and quantity of the crop, and to suppress speculation and monopolies. Membership in the organization assures the planters a fair profit on their crops, for when the market price of cacao falls to a point that the Association considers too low, it buys the crop and stores it until the price has risen.

Smaller organizations have been formed in the various provinces to modernize planting and harvesting methods and to secure a higher quality in other crops besides cacao. Better seeds have been introduced into the country for coffee, rice, cotton, and peanuts, and selected live stock for breeding purposes is being imported.

Probably the largest cacao plantation in Ecuador is the Caamaño Tenguel Estate, sixty miles from Guayaquil. It is owned by a British syndicate, and produces about one fifteenth of the total cacao output of the republic. It really is made up of eight separate plantations, covering altogether a half million acres. Besides its three and a half million cacao trees, the estate raises also coffee, sugar, bananas, and rubber, and has more than a thousand head of cattle. It supports the progressive little town of Tenguel, which has modern homes for the employees, a church, a school house, a club, and a physician to look after the health of the workers and their families. It has its own fire brigade, waterworks, electric light plant, and a private telephone system connecting all parts of the several plantations.

It was some four hundred years ago that chocolate was first drunk in Europe, where it was introduced by Cortes soon after his conquest of Mexico in 1519. He and his

LANDS OF THE ANDES AND THE DESERT

band of conquistadors found cacao beans being used as money in Mexico. Ten beans was the price of a rabbit, while a fairly good slave might be had for a hundred. No less than two thousand jars of chocolate were made every day for the Emperor Montezuma and his court. The monarch's drink was flavoured with vanilla and chilis and beaten into a froth. He drank it from a golden goblet and stirred it with a tortoise-shell spoon. Pizarro found the Incas enjoying the same drink in Peru.

The Spaniards readily took to the new beverage, and from Spain chocolate drinking quickly spread to France, Germany, and Italy. By 1665 it had become a feature of the court life of the "Merry Monarch," Charles II, of England. Only the wealthy could have indulged in it then, for a pound cost the equivalent of five dollars in our money. Cardinal Richelieu, the great prime minister of Louis XIII, found that it marvellously restored his vitality. The Spanish princess, Maria Theresa, was said by one historian of her time to have but two passions: her husband, Louis XIV, and chocolate. Its stock went down, though, when Madame de Coëtlogon, one of the ladies of the court, had a child "as black as the devil" because of the quantities of chocolate she had drunk. And in 1673 the English brewers and grain growers demanded the prohibition of chocolate along with rum, brandy, and tea, because the popularity of these drinks cut down the consumption of drinks brewed from good old British barley. The prohibitionists were unsuccessful, however, and England and the rest of Europe continued to sip its chocolate.

While cacao is the chief source of income of Ecuador, coffee and rubber are also important in its trade with the

A LAND OF CACAO

rest of the world. The coffee grown in this country is especially popular in Europe, where some four million pounds of it are consumed every year. As to rubber, it is now being produced here under plantation methods, and more than a million trees have been set out. With intensive and scientific cultivation, there is no reason why Ecuador should not compete with Malaysia as a source of rubber.

Another great export of Ecuador is ivory nuts, which come from a low palm tree known as the *tagua*. The fruit is as large as a man's head, and looks somewhat like a huge chestnut bur. The bur contains from sixty to ninety nuts, each the size of a baby's fist. It is from these nuts that we get our vegetable ivory, which in recent years has become an important commodity. In the green state the nuts are soft and jelly-like inside, but when ripe they are as hard as bone throughout. They can be dyed any colour, and take a high polish.

The ivory palm grows wild in the forests and the natives travel through the woods to gather the nuts. There are organized bands of *taguaros*, or ivory-nut gatherers, who camp out in the swampy forests and bring the product in boats to Guayaquil. The boats are usually rafts made by the Indians of balsa wood, which is so light that two men can carry a twenty-foot log two or three feet thick. The nuts are carried to the rafts in rude baskets and then floated down the rivers. Often they are delivered to an agent who makes a business of furnishing outfits to *taguaros* in return for most of their crops.

The United States buys twenty million pounds of ivory nuts a year and turns them into buttons, paper knives, and everything that can be made from vegetable ivory.

LANDS OF THE ANDES AND THE DESERT

When the nuts come to the factory they look like small potatoes. They are dried and the hard shells removed. Next they are sawed into thin pieces, the slices being taken off the sides until only the very centre, which is useless, is left. As the slices of ivory are further dried, their bluish white colour changes to a creamy hue, and they are ready to be made into finished products.

Most of the buttons we use are from these palm nuts, so that it may be truly said that Ecuador fastens together the garments of America.

CHAPTER VI

THE CAPITAL OF ECUADOR

NINE tenths of the inhabitants of Ecuador live in the clouds. There are a dozen towns twice as high as Denver, and Quito is one of the highest capital cities in the world. It is more than a half mile higher than Mexico City, and a thousand feet nearer the sky than the hospice of St. Bernard in the Alps, the highest point in Europe where men live all the year round. It is situated in a valley between two ranges of the Andes, on the very roof of South America, and only about fifteen miles from the Equator.

In 1897, when I made my first trip to Ecuador, one could cross the Andes to Quito only on mules. The round trip cost more than one hundred dollars, with an additional charge for every pound of baggage. All goods had to be carried on the backs of mules or men. At one point I saw twenty-four Indians starting for Quito bearing on their heads a piano in a great box. The cost of transportation was almost equal to the original price of the piano, and the freight on a small boiler shipped to Quito was one hundred dollars.

There were then almost no roads over the mountains. Men and mules toiled along narrow trails, forded rushing streams, and often sank deep in mud. The ascents were so steep in places that all one could do was to put his arms around the neck of his mount and hold on for dear life.

LANDS OF THE ANDES AND THE DESERT

Going down hill the mules sat on their haunches and slid. As the Ecuadorians say, their "roads are for birds, not men." Now there is a railroad from Guayaquil that carries one comfortably and quickly over this region of former discomfort, and Quito is readily accessible at all times of the year.

Come with me for a journey over the route of the Guayaquil and Quito Railroad. We cross the Guayas River on a ferry early in the morning and by seven o'clock have left the terminal at Duran and are moving through the tropical lowlands.⁷ There are pastures containing herds of fat cattle, cacao groves loaded with the squash-like fruit hanging close to the trunks and branches, and many little villages with houses on piles so that the first floors have to be reached by ladders. These houses are thatched with broad white leaves tied to a framework of bamboo. The floors are of cane, and the cracks are so many that the women do not need to sweep, for the dirt falls through to the ground or the water. We pass banana plantations, fields of sugar cane, and modern sugar mills, go through forests loaded with orchids, and finally stop at Bucay, which is fifty-seven miles from Guayaquil. Our wood-burning locomotive is now changed for one built in Philadelphia that uses oil fuel, for here the Andes begin to rise steeply before us. With the further development of the oil fields of Ecuador, it is expected that none but oil-burning locomotives will eventually be used.

The speed of the train so far has been not quite twelve miles an hour, and we have risen to an altitude of less than one thousand feet. In the next three hours we rise three thousand feet more to Huigra, where the Americans in charge of the railway have their homes and offices. It is



Construction of the Guayaquil and Quito Railroad was a triumph of American engineering skill. The "Devil's Nose," on the most difficult part of the route, has three levels of track, one above the other.



As the capital of a country intensely devoted to the Catholic faith, Quito has many fine churches, of which that of the Jesuits is considered the most beautiful in design and decoration.

THE CAPITAL OF ECUADOR

proposed to build a branch line from here to Cuenca, the third city of Ecuador. From Huigra we go on up, up, sighting Chimborazo, higher than our own Mount McKinley in Alaska, and in the early evening reach Riobamba. Here we spend the night, as travelling by darkness is still considered dangerous in Ecuador. Our climb is resumed the next morning, and during the day we go over the pass at Urbina, the highest station on the road, nearly twelve thousand feet above the sea. We reach Quito late in the afternoon, at the end of a two-day journey covering two hundred and eighty-six miles.

The building of the Guayaquil and Quito Railroad, like most of the trans-Andean roads of South America, presented almost insurmountable difficulties. At one place on the route, known as the "Devil's Nose," the track proceeds from one switchback to another over ground dangerous in the extreme. The successful completion of the road is a monument to the engineering skill and determination of Archer Harman, the Virginian who conceived and built it. A few years ago his nephew, bearing the same name, became the president and general manager of the line.

Quito is walled in by some of the highest peaks of the Andes. Just back of it is the active volcano, Pichincha, its snow-capped peak so near the city that it furnishes the ice for making Quito's ice-cream. Pichincha has a crater a half mile deep and a mile wide at the bottom. It is a mile higher than Mount Etna; and its eruptions, which occur at long intervals, are such stupendous blasts from the fiery bowels of the earth that Mount Vesuvius seems but a portable furnace in comparison. A fair road has been built to its summit, from which twenty other volcanoes are visible.

LANDS OF THE ANDES AND THE DESERT

Let us hire an automobile and ride up Pichincha. At the top we see all Quito spread out in the valley beneath us. It is a city of white adobe houses roofed with red tiles, with the towers of churches and monasteries rising here and there. There are no chimneys, and the houses, mostly of one or two stories, look squatty. They stand along narrow streets that cross each other at right angles. Two deep ravines, one of which is arched over, divide the city from east to west. In the centre is the Plaza Mayor, a great square on which face the cathedral, the government palace, and the city hall.

Quito is one of the ancient seats of learning in South America. It has a university a half century older than Harvard, a library, a museum, an astronomical observatory, and a technical school. Its theatre is subsidized by the government and is visited by troupes of players from up and down the west coast. The special accommodations for persons in mourning are an odd feature of the theatre. They are boxes fitted with shutters so that the occupants can look through the slats and watch the performance or the audience without being seen themselves. When in deep mourning the afflicted use only the slats, but later the shutters are gradually opened. This custom reminds me of the Chinese, who send out white cards at the death of a relative to express great sorrow, and follow them a few months later with blue cards labelled, "Grief not so bitter as before."

The city is not one third as large as it was three hundred and fifty years ago, before the invasion of the Spaniards. Then it had several hundred thousand people with a better civilization, on the average, than the masses of Ecuadorian Indians enjoy to-day. According to tradi-

THE CAPITAL OF ECUADOR

tion, there was a town on the site of Quito a hundred years before Christ was born, and it is known that a city existed here in 1000 A. D. It had long been the capital of an ancient Indian nation when it was captured by the Incas, and it was the northern capital of that mighty race when the city was taken by the Spaniards in 1534. This was about a hundred years before the cows began to mark out the streets of Boston. Atahualpa, the Inca monarch who was captured and murdered by Pizarro, had a palace at Quito, the roof of which, it is said, was covered with pure gold. It is believed that vast quantities of the treasures hidden by the Indians at that time are still buried in Ecuador.

Quito has many Indians to-day, although most of its people are whites. The Indians from the country for miles around also come in to trade, and those seen on the streets are of a dozen different tribes, with as many picturesque costumes. They have adopted the Christian religion, and go from church to church saying their prayers. Being extremely superstitious, they are controlled largely by the priests.

Until recently Ecuador was entirely Catholic. Up to the beginning of the twentieth century its national constitution prohibited any other form of worship. Since then laws have been passed giving full religious liberty, and the Protestants have sent in missionaries who have distributed tons of Bibles throughout the land. However, the vast majority of the people probably will always be Catholic.

One of the finest buildings in Quito is the Jesuit Church, and the convent of San Francisco is said to be one of the largest in the world. There are eleven monastic establish-

LANDS OF THE ANDES AND THE DESERT

ments, six of which are nunneries, and religious processions are frequently seen in the streets. The people of Quito have contributed so generously to the Church that the city has sometimes been called "The Little Mother of the Pope."

The government of Ecuador is vested in a president who rules through a cabinet of five ministers and a council of state. There is a congress elected by the people. The president has the power of veto, but the congress can pass a law over his veto. Just now the most pressing public questions are the improvement of the ports and the building of railroads. Means of transportation are so poor in the interior that the mails to the Oriente are carried only once a week, on horseback. In the past, travellers from the regions east of the Andes have gone almost around the continent to reach Quito. Rather than make the journey across country over the rough mountain trails, they have gone down the Amazon to the Atlantic, thence by steamer to Buenos Aires, and by the Transandine Railway to Valparaiso, Chile. They there took another steamer up the west coast to Guayaquil, and made the last lap of the journey from that city up to the capital.

Although the department of the Oriente occupies about sixty per cent. of the entire area of Ecuador, its white population, consisting chiefly of government officials, numbers only a few more than a hundred people. Formerly, there were many more whites employing large gangs of native rubber gatherers, but that industry has greatly declined in recent years. The region is fertile and well watered, and the Indians raise rice, corn, beans, sugar cane, bananas, and pineapples. When railway con-

THE CAPITAL OF ECUADOR

nection is effected with the western part of Ecuador, the Oriente will be a promising field for colonists.

Control of the expenditure of money involved in national improvements is often the cause of the frequently occurring revolutions in the country. Each time I have visited it, Ecuador has been in the throes of an uprising. During my first trip to South America, the head of the administration was Don Alfaro, who later lost his life trying to recapture the presidency after he had been in exile in Panama. Alfaro was a born revolutionist, and had many narrow escapes. At one time he was captured by members of the rival political party while on a little Ecuadorian gunboat, and escaped by swimming to the shore on a barrel. At another time he lived for weeks in the wilds of Ecuador and Colombia while being hunted by government troops.

One way in which a popular clamour against the government in power has been started is for a revolutionary leader to charge that the president is plotting to sell the Galapagos Islands to another nation. These are, perhaps, the strangest islands in the world. They are officially known as the Archipelago of Colon, and are governed as a territory of the republic. Lying in the Pacific six hundred miles off the coast, they consist of ten large and innumerable small islands of volcanic origin. Their combined size is not greater than that of Rhode Island, although they are scattered over an area equal to our state of Maryland. They were discovered in 1535 by a Spanish bishop whose boat was blown out of its course in going from Panama to Peru. The numbers of gigantic turtles he found there led him to call these bits of land "Galapagos," the Spanish word for those reptiles.

LANDS OF THE ANDES AND THE DESERT

Of human inhabitants there were none then or for three hundred years afterward.

The islands were first explored by American whaling crews. Sperm whales were found to be abundant in the near-by waters, and for years the site was used as a base for the industry. In 1832 an expedition was sent by the Ecuadorian government to take formal possession of the Galapagos, perhaps with a view to obtaining a revenue from the whalers or because it was feared that a foreign country might annex the islands. In the ensuing years a half-dozen projects for the lease and exploitation of the islands by various countries came to naught, while Ecuador herself retarded their development by making them a penal colony.

The chief interest of the Galapagos group has been geological and biological rather than commercial. Here are found the largest turtles on earth, many of them being three feet high, and some weighing six hundred pounds. These reptiles have been killed in such numbers for the oil they contain that their extinction seems only a matter of time. Gigantic lizards of prehistoric type, often three or four feet long exist here also, while rare birds and plants abound. The islands have two hundred species of plant life that are found nowhere else in the world, as well as hundreds of well-known varieties. One peculiar weed growing here is the orchilla, often called dyers' moss. Before the discovery of aniline dyes it was used in the manufacture of certain tints, and gathering it was at one time a profitable industry. In several parts of the island are found many trees, which, though not large, have a luxuriant growth and are often bound together with a jungle of creepers and underbrush.

THE CAPITAL OF ECUADOR

After the opening of the Panama Canal the islands came once more into the limelight. Lying directly on the ocean routes from Panama to New Zealand and Australia, they have great possibilities as future naval fuelling stations. They hold much the same relation to the Pacific entrance to the Canal that the West Indies do to the Atlantic entrance, and for this reason may some day possess international strategic importance.

CHAPTER VII

THE HEAD-HUNTING JIVAROS

PROBABLY the most warlike Indians in all South America are the Jivaros, who live in the forests of eastern Ecuador. They are man-hunters who preserve the heads of their slain enemies as trophies of war. I have seen several such heads during my travels and was once offered one for a hundred dollars in gold. I refused to buy it lest the ghost of the dead man haunt me the rest of my life. The head was about as big as my fist, the bones of the skull having been removed and the flesh so skilfully shrunk that none of the features were lost. The skin was black and the long thick hair was of the same raven hue. The nose was almost negroid in shape and the lips were sewed together with cotton strands that hung down like a fringe.

When the Indians discovered that travellers and scientists were willing to pay high prices for these cured heads, they began to kill their enemies on the slightest pretext. The supply still not meeting the demand, the warriors cast aside their few remaining scruples, and killed members of their own tribes and sold their heads. Since then, the government has passed a law making it a crime to buy or sell *ɰbanɰbas*, or cured heads, and the severest penalties are now imposed upon any one caught engaging in the traffic.

After killing his victim the Jivaro cuts off the head close



The Jivaro Indians are known as head-hunters, having long been experts in the ghastly art of preserving such trophies, skillfully removing all the bones of the skull and shrinking the flesh without destroying the outlines of the features.



The forest furnishes the Indian all the poles and thatch he needs in building his hut; also the logs which, when hollowed out, provide him with means of transportation along the river that usually flows by his front door.

THE HEAD-HUNTING JIVAROS

to the shoulders, and carries it to camp. There he opens it, crushes the skull, and takes out the bones. The skin is then sewed together from the crown to the base of the neck and painted with the juice of the huito, a fruit that looks much like an aguacate pear. This juice is a preservative and is smeared on both inside and out. The head is next filled with hot sand to preserve its shape. As the flesh dries, it is pressed inward from time to time, and some of the sand removed, until the head is reduced to one fourth or one fifth of its original size. As it grows smaller, a stone is inserted and the flesh is worked down upon it. This stone is taken out before the skin has grown too hard, but not until after the features are fixed. The head is then hung up over a fire to be cured by the smoke.

The story is told that a red-whiskered German came out to Ecuador some years ago to learn the head-curing process. He went to Quito and then made his way eastward to the Indian country. He was never seen again, but about three months after his disappearance a beautifully cured head was brought in for sale. The skin was light and the features were Teutonic in cast, while on the chin was a beard the colour of brick-dust.

A tale is also current that another Teuton whose head was sought by the Jivaros was no less a personage than Kaiser Wilhelm himself. In 1918, when newspapers all over America published the opinions of various readers as to what should be done with the Kaiser, it is said that the following advertisement appeared in a Riobamba newspaper:

The Head of the Kaiser

To him who produces it I offer a prize of one thousand sucres to convert it into a *ghanzha* and keep it as a war trophy.

LANDS OF THE ANDES AND THE DESERT

This offer was signed by an agent of the Jivaros, one of the few white men who have ever been on friendly terms with them. Being able to speak their language fluently, he had endeavoured to tell them of the World War, which was then at its height. As a result, he was directed by the Jivaro chief to make the above announcement.

The Jivaro Indians are well-built, good-looking men. They are polygamists, some of them having seven or eight wives. One reason for this is that when a girl marries all her sisters become wives also and share the husband with her. They have large families, but the population is kept down by feuds, during which one family will lie in ambush for another and kill any of its members on sight. In order to be ready to defend themselves, they sometimes sleep in a sitting posture, each brave having his spear between his knees.

These Indians are very superstitious. They have witch doctors who brew a tea called *biahuasa* from the roots and the leaves of a shrub. The drink has the effect of opium, in that it makes one dream and see visions. An American with whom I have talked tried it once. Shortly afterward spots began to dance before his eyes and a little later he saw pictures of saints. The witch doctor told him to concentrate his mind on his family. He did so and at first saw only snakes, but finally his family appeared before his mind's eye far more realistically than in any dream he had ever experienced before.

The Jivaros live in villages, usually near a river or a small stream. Their houses are often sixty feet long and thirty feet wide, and are made of bamboo slats tied together on a framework of poles. The roof is of thatch, and there is a heavy wooden door at each end. Several

THE HEAD-HUNTING JIVAROS

families live in one house, the men sleeping at the front of the hut and the women at the back. The beds are long platforms slightly higher than the level of the floor. Between these platforms and the fires, which are kept burning all night, are wooden poles that serve as foot rests for the sleepers, who do not consider themselves comfortable unless they roast their toes. Hanging about the walls of the houses are the hunting equipment and the personal adornments of the men. The only other furnishings are the earthenware pots in which the women cook the meals. When a Jivaro dies in one of these dwellings the body is buried under the house, and the whole building burned down. The other occupants then move away and build another house.

The favourite weapon of some of the Ecuadorian Indians is a reed blow-gun, through which they shoot poisoned darts. These guns are long tubes just large enough for the arrows, which are wrapped with cotton at the ends to make them fit closely. The arrows are not more than a foot or a foot and a half long and not much thicker than a wooden toothpick. The poison with which their tips are smeared comes from Brazil. These blow-guns have a range of from forty to fifty feet and with them the Indians can hit a bird or a monkey perched in a tree top. For fighting they use also spears much like those of the knights of the Middle Ages.

Some tribes poison their spears with the juice of a plant mixed with liquid from dead bodies in a state of putrefaction. They put up this preparation in earthenware jars or in joints of bamboo and make it an article of commerce among themselves. It is used also on hunting arrows to kill game, and does not, apparently, poison the meat.

LANDS OF THE ANDES AND THE DESERT

I have talked with a German who has spent three years among the Indians of the eastern Andes. He was twice wounded with poisoned arrows and had narrow escapes from the head-hunters near the River Napo. He tells me that some of the Indians in that region wear in the lobes of their ears cylinders of wood or metal as big around as the bottom of a tumbler. The holes for these strange ornaments are first made during childhood, and gradually enlarged by inserting bits of grass and twigs until they become big enough to hold the ear plugs. The same custom prevails in Burma and in other parts of the Orient, while in the highlands of east central Africa I have seen ear lobes stretched so much that when the plugs are taken out they hang down like straps. Their owners sometimes fasten them over the tops of the ears in order that they may not catch in the trees and brush of the forests.

The few explorers who have made their way through the eastern slopes of the Andes from Ecuador to Bolivia say that cannibalism still exists among some of the Indian tribes. I have pictures of cannibal Indians, called Cachibos, who live along the River Pachitea in Peru. These people give as an excuse for the custom their belief that he who eats a man acquires all the courage and other good qualities possessed by the victim. Moreover, they say they would rather be eaten by men than by worms. The Cachibos hunt with blow-guns and poison-tipped arrows. They do not know the use of money, and all their dealings are by barter. They wash gold from the streams and bring it to the traders as nuggets and coarse dust.

The Aguarunas are a warlike tribe who fight with poisoned arrows and build war towers for defence. They are polygamous and one man may have a half-dozen wives.

THE HEAD-HUNTING JIVAROS

Both men and women wear nothing but short skirts of bark or cotton.

Another curious tribe, found farther south in Peru and Bolivia along the Madre de Dios River, are the Huachipairis. For personal adornment they wear feathers and sticks thrust through holes pierced in their upper lips. They cultivate the soil and weave cloths and ropes of wild cotton. Like the Aguarunas and Jivaros, the men have several wives apiece. The warriors often make raids on the Quichuas, the descendants of the Incas who live on the high plateaus of the Andes, and steal the Quichua women to replenish their harems. Sometimes wives are bought and sold, the price of a woman being a knife or a hatchet. These Indians are unfriendly to the whites and so far the missionaries have been able to do little with them. In contrast to the many fierce tribes of savages known as "bad" Indians, are the Yumbos, or "good" Indians. For a long time they were in a state of peonage, and they are still submissive and willing to work for the whites for almost no wages. Although their customs show traces of the efforts of the Spaniards to Christianize them, they are superstitious to an extreme. During a severe epidemic of smallpox some years ago, when they died by the thousands, the survivors hid in the forest rather than submit to vaccination, which they believed would offend the evil one.

The religion of the Indians of the eastern Andes is of the most primitive nature. Some tribes believe in a god and some in a future life, in which the soul goes through a series of transmigrations much like those described in the Buddhist faith. They say that the spirits of the good live again in jaguars and monkeys, while those of the evil

LANDS OF THE ANDES AND THE DESERT

inhabit the bodies of reptiles and parrots. Some of the Indian tribes believe there are two gods, one evil and one good, that fight for the control of mankind. The Conibos are sun worshippers, as were the Incas at the time of Pizarro. Nearly every tribe has its witch doctors, and all are honeycombed with a myriad of superstitions.

Certain tribes have legends of the beginning of man. One is that when the world emerged from its original chaos all mankind lived in a great cave, the entrance to which was guarded by a tiger. The human race was kept prisoner by this beast until one day the liberator of mankind, a giant among his fellows, fought with the tiger and killed it. Then man came out and populated the earth. After living so long in a cave the people had become very dirty. They realized this when they reached the light of day and so decided to wash. They heated water in a colossal earthen jar. Those who got the first bath came out white and thus the white race was created. Those who had the next bath were brown and formed the brown race. The last to bathe had only the dregs left in the jar and so were black.

Some of the tribes wear clothes made of tree bark. I have a blanket of bark cloth made by these Indians. It is as large as a bed quilt and as soft and pliable as though it were wool. I have rolled it up and carried it about in a shawl strap. Still, it is merely the unwoven bark of a tree. The Indians make cuttings about the tree, tear off the bark in sheets, and soak it in water, after which they pound off the rough outer layers. The inner layers are composed of fine fibres so knit together by nature that they are not unlike cloth. They are warm enough for blankets and soft enough to take the place of a mattress. The same

THE HEAD-HUNTING JIVAROS

sort of cloth is made in Uganda in tropical Africa, where it is a common article of clothing. Like the Africans, also, many of the South American savages are musical. They have reed or bone flutes and three-stringed violins. Drums, made out of hollow logs, are used for sending messages from camp to camp.

None of these tribes associate with one another. They have no organized governments, and in each one the chiefs are generally chosen for their superior ferocity and strength. Their languages differ widely and there is no common method of writing. Some savages count by movements of the fingers, but all are in a low state of development and are sinking lower through contact with the vices and the liquor of the whites.

Few of the South American Indians are equal, physically or mentally, to those of North America. Most of them are short in stature and they vary in colour from reddish brown to black. They have high cheek bones and black eyes, with long, straight black hair. Some are very strong, and a few are brave, but the majority are cowardly and afraid of white men.

These primitive peoples are widely scattered and the social organization of many of them is in families rather than in tribes. There are probably not more than one hundred thousand all told on the eastern slopes of the Andes. The Geographical Society of Lima, Peru, estimates the number of savages in those regions at about one hundred and fifty thousand.

Indians form three fourths of the population of Ecuador, but the majority of them are at least semi-civilized, as distinguished from the wild tribes I have described. These people do all the rough work of the country, and until 1918

LANDS OF THE ANDES AND THE DESERT

most of them were practically the slaves of the landholders. Slavery did not, of course, exist as in the days of Pizarro, when the Indians were branded, whipped, and killed at the will of their owners, but it was in force through the laws and customs by which the peons were kept in debt to their masters. Wages were low and once an Indian got in debt he found it almost impossible to get out.

It was a common procedure for a planter who wanted labourers for his estate to go to the jails and settle the debts of such prisoners as agreed to work out the money thus paid. He then gave them very low wages, and always held back a portion of what was due them. The farm hand was given a hut to live in, and received a daily ration of a little meat, rice, or beans, and some lard or salt. He received also a hat, three coarse cotton shirts, and three pairs of cotton pantaloons a year. In addition, he was given a few cents in money. The hours of work were from sunrise to sunset, and when a man skipped a day it was charged against his wages. The women and the children were forced to labour as well as the men.

If a peon once was free from debt the conditions soon compelled him to become a debtor again. He had nothing ahead and if there was a death in his family he had to borrow money for the funeral. If he would be married by the priest he was charged six dollars, and consequently many of the Indians were obliged to forego the ceremony. For this reason it is said that seventy-five per cent. of the births in Ecuador formerly were illegitimate.

In 1918 debt slavery was abolished by law, and since then conditions have greatly changed for the better. Although the lot of the unskilled Indian labourer and his family is still a hard one, wages and living conditions in



Most of the inhabitants of Ecuador are Indians. These primitive people, while no longer subject to either slavery or peonage, are desperately poor and have little hope or capacity for bettering their condition.



Along the coast of Peru and Chile, between the Andes and the ocean, lies a narrow strip of desert, more barren than the Sahara, with sand dunes that are continually being shifted about by the winds.

THE HEAD-HUNTING JIVAROS

general have been much improved. Some of the workers have organized themselves into unions, and have thus been able to make better terms with their employers. The government also is doing much to give these people the advantages of education and modern civilization.

CHAPTER VIII

DOWN THE DESERT COAST OF PERU

I HAVE come from the jungles of the Ecuadorian tropics to the desert of Peru, a region as barren as any part of the Sahara. From the ocean to the Andes it is nothing but sand and rock, and the mountains themselves are as sterile as the driest part of our great western plateau.

Peru is divided naturally into three zones. The first is this desert coastal region, the second consists of the high Andean valleys and plateaus, upheld by the three parallel ranges of these mighty mountains, and the third slopes eastward from the Andes to the Amazon Valley. The latter region, which forms the larger part of the republic, has never been thoroughly explored.

Peru extends north and south through one fourth of the length of the entire Andean highland. It is more than one thousand miles long, and in places more than seven hundred miles wide. If it could be laid down on the United States with the Chilean boundary at New Orleans, southern Ecuador would be somewhere near Minneapolis, and the country would extend from the Mississippi River eastward to Pittsburgh. Peru is equal to more than one fifth of the area of the United States, and is six times as large as Great Britain and Ireland. There is enough of it to make fourteen states as big as New York, and one of its departments, the name of which many of you have never

DOWN THE DESERT COAST OF PERU

heard, is larger than Texas. That is Loreto, at the headwaters of the Amazon. The department of Cuzco, in southern Peru, is nearly as big as California, and there are other departments almost as large.

The South American desert begins south of Tumbes, near the Ecuador-Peru boundary, and extends from there southward along the western coast of the continent for two thousand miles. It borders the whole of Peru and reaches down into northern Chile almost to Valparaiso. In no place is it more than ninety miles wide. At its eastern edge it is merged with the Andes, which, from their foot-hills to their snow-capped peaks, are practically without vegetation.

I have seen something of the other great deserts of the world. I have been on the edge of the Kalahari in South Africa, and I have travelled through the Sahara from Morocco to the valley of the Nile. I have sailed along the coast of Arabia, and I know something of Gobi, on the edge of Mongolia. None of them is like the Peruvian desert, and none seems to be so fated to remain barren for all time to come.

This desert forms a strip between the ocean and the great wall of the Andes. Those mountains rise almost precipitously from this long coastal plain. It is so cold at the great height of their peaks that winds from the east lose all their moisture by condensation before they reach the Pacific slope. It is this phenomenon that causes the rains that cover eastern South America with tropical verdure and gives the valleys of the Amazon and the Paraná the greatest water supply known to man. But while most of the continent blooms like a garden, the lands west of the Andes have practically no rain.

LANDS OF THE ANDES AND THE DESERT

Throughout this desert strip of two thousand miles nearly all the water comes from the little rivers that have their sources in the melting snows on the tops of the mountains. It rains so seldom that there are people living on the coast who have not seen an umbrella in twenty years, and who get a good laugh over the occasional American who comes here to sell waterproof coats and rubber boots.

Parts of the desert of Peru are rocky, like much of the Sahara, and parts are covered with sand as fine as that surrounding the pyramids on the banks of the Nile. In some places the sand gathers in great crescent-shaped dunes that move over the desert. The strong south winds roll the sand grains up over the top of the crescent, which, like the crest of a wave, moves steadily onward. The shifting dunes climb the hills and make their way through the valleys. They will not stop for roads or railways, and it is impossible to keep them back by wind-breaks or fences. Some of the railways that cross the desert have been covered over again and again, and it is repeatedly necessary to dig out the tracks so that trains may pass. The sand often covers up the trails, and frequently blots out landmarks.

The only fertile regions of the desert are where the snow-fed rivers from the mountains cross it on their way to the sea. There are fifty-five such streams along the coast of Peru, and it is estimated that they make it possible to irrigate an area of fifty million acres. About two million acres are now cultivated, producing large crops of sugar and cotton. American tractors are used on the bigger plantations, and there are many sugar factories with modern machinery. These oases comprise the most important agricultural lands of Peru. They feed the greater

DOWN THE DESERT COAST OF PERU

number of the people and supply much of the export products of the republic.

My first port of call along the coast of Peru was Paita. It has streets of sand and sidewalks of wood. Most of the one- and two-story houses are of recent construction, as many of the buildings of the town were burned some years ago by a commission appointed to eradicate yellow fever and bubonic plague. The older structures are painted all the colours of the rainbow. The customs house, for example, is bright green, and when I passed through the plaza behind it I faced a church of sky-blue surrounded by buildings as yellow as gold. The plaza contains about the only bit of vegetation in the whole town. This is a garden no larger than an ordinary room, filled with stunted palm trees and thirsty-looking plants.

Although a few motor trucks and automobiles are now in use in Paita and in other parts of the Piura district, donkeys form most of the traffic of the city. I saw caravans of them bringing vegetables, sugar, and rice to the port, and when I went to the post office I walked along beside the mail wagon, which was a dray drawn by a mule. Much of the drinking water is peddled from house to house in ten-gallon kegs carried by donkeys.

Paita has a railroad to the Piura Valley, which is about sixty miles inland. I am told that this road may be extended a distance of four hundred miles over the Andes to connect with the Marañon River, one of the great tributaries of the Amazon. This extension would give Paita direct connection with the upper Amazon Valley and would bring one of the most fertile parts of South America within a few days' travel of the Panama Canal.

The Piura Valley is one of the richest of the desert oases.

LANDS OF THE ANDES AND THE DESERT

It produces the famous native cotton of Peru. Thousands of bales of this cotton, comprising sixty per cent. of the total crop, are shipped to the United States, where it brings several cents a pound more than the cotton raised in our Southern States. Practically all the rest of the yield goes to England. This "Peruvian rough" cotton, as it is called, has a heavy, kinky fibre, and looks and feels like wool. It is usually spun on woollen machinery, and is mixed with wool in the manufacture of hats, hosiery, and underwear. It is said to give wool-and-cotton mixed cloth a finer lustre and to render it less liable to shrinkage than do other varieties of cotton.

Indeed, this land seems to have been one of the first homes of cotton. The plant was growing here when Pizarro came, and he found cotton cloth in the tombs of people who lived long before the Incas. The Incas undoubtedly sold it also to tribes in other parts of South America, as mummies wrapped in cloth made of this characteristic Peruvian cotton have been found along the Amazon in Brazil.

The Peruvian variety grows on a tree that bears for twenty years. The common method of planting is to put the seeds in the ground with a stick, and let the trees grow to a height of six or eight feet. After that they are cut back from year to year in order that the crop may be more easily gathered.

The picking is done by native men, women, and children, who also sort the cotton by colour before it is ginned. I say by colour, for much of the Peruvian product is brown or red. Brown and white varieties grow on the same tree, and there may be brown and white lint in the same boll. The coloured cotton is sold largely to the Indians,

DOWN THE DESERT COAST OF PERU

who use it for their ponchos and hammocks. While most of the crop is exported, some of it is manufactured in this country. There are several cotton factories in Peru, all but two or three of which are in Lima.

The Peruvians are now growing also upland cotton and sea-island cotton from American seed. The sea-island cotton has but a small acreage, its production being limited to a few little valleys. The upland cotton here yields for three years in succession without replanting.

Paita is near Peru's most important oil-producing region. My steamer brought here two barge-loads of iron pipe and eight-inch cast-iron casings for the Lobitos oil fields, which are situated along the coast not far from here. Farther south I saw from the boat the derricks of the petroleum port of Talara. There are oil wells at Tumbes, and there is a refinery at Zorritos, where between forty and fifty wells are producing. Oil is being found also in southern Peru, and even on the shores of Lake Titicaca, two miles above the sea, where it has been struck at a depth of about eight hundred feet.

The annual petroleum exports of Peru are worth more than twenty million dollars, and the business is still only at its beginning. The oil is of a high grade, and it can be used for lighting as well as for fuel. The steamer upon which I am travelling down the coast burns fuel oil instead of coal, and has taken on a fresh supply at Paita, where oil is stored in a great round tank on the bluffs above the town. A pipe line runs down to the ocean, and the fuel is brought out to the steamer in a little oil barge.

As at most of these west coast ports, steamer passengers are landed at Paita in small boats. There are few harbours, and vessels must usually lie in the open roadsteads

LANDS OF THE ANDES AND THE DESERT

and transfer cargo by lighters. The moment our ship came to anchor off Paita white boats with red flags started out from the shore. They were rowed by bare-footed blue-clad Indian sailors with white caps on their heads. Behind them came the small craft of the natives bringing vegetables and other products out to the steamer, and still farther back were tugs towing the great barges loaded with freight to be taken on board.

Among the merchandise the natives brought out to the ship were the finest of Panama hats. I bought one for about ten dollars, although the first price of the Indian salesman was six pounds, or thirty dollars. I offered him one pound ten shillings and he came down to five pounds. At the last moment he took two pounds. The hat is as closely woven as the finest of silk and so soft that I can bundle it up in my pocket and hardly know it is there. The straws are no bigger around than a needle.

The Panama hats that are now sold so largely in our stores are not made in Panama. They come from Ecuador, Colombia, and northern Peru. They are shipped from here all over North America, as well as to Germany, France, and England, and to other parts of South America. The Ecuadorians are now also exporting the straw, much of which comes down into Peru, where it is made into hats.

Ordinary Panamas, such as are commonly sold in our stores, can be bought in Paita for one or two dollars apiece. They come chiefly from Guayaquil, which exports several hundred dozen of them every month. The very finest Panamas cost so much that there is practically no demand for them abroad. Some, which sell here for as high as one hundred dollars, would cost twice as much in New York. One, made several years ago as a present



There are few sheltered harbours on the west coast, and large ships usually lie offshore. A newly arrived steamer is quickly surrounded with the rude craft of Indians peddling fish, fruit, or vegetables.



The only water on the western slopes of the Andes comes from the rivers fed by the melting snows of the mountains, but it is estimated that these streams make possible the irrigation of some fifty million acres of land.

DOWN THE DESERT COAST OF PERU

to the King of England, was so finely woven that it could be folded into a package no larger than a man's watch. That hat was more than six months in the making. It was of the finest straw, and the work upon it was done only during certain hours of the morning and evening, when the amount of moisture in the air was just right.

The Panama hat is made from the leaf of a palm called the *toquilla*. This tree is now cultivated. It becomes full grown at eighteen months and lives for forty years or more. The straws are made from the new leaves, which are cut off just as they are about to unfold, and split with needles or with the fingernail.

At the port of Eten, which was our next stop after Paita, the sea was so rough that passengers were lowered from the ship to small boats in a barrel, which had been turned into a chair by cutting part of it away. Travellers were brought aboard from the boats alongside in the same manner. I saw three women thus lifted; one of them wrapped her head in her shawl and seemed to be praying fervently all the way up.

Steaming on to the south, we came to Pacasmayo, which, with its low white buildings and flat roofs, looks like a town of Arabia. It lies on the coast, with the desert and the mountains behind it. It has a steel pier built by the American engineer, Henry Meiggs, when he was constructing railroads in this part of South America. From the town a little railway runs back into the valley to Chilte and thence northward to Guadalupe. This line may some day be extended to the Amazon region by an easy pass over the mountains.

High in the Andes not far from Pacasmayo is Cajamarca, where the Inca king, Atahualpa, was put to

LANDS OF THE ANDES AND THE DESERT

death by Pizarro, the Spanish invader. Arriving at this northern capital of the Inca Empire on the fifteenth of November, 1532, Pizarro found it a well-built city lying in the beautiful valley of a little river, the waters of which irrigated many fields and gardens. The use of the buildings of the town as quarters for his troops was offered Pizarro by Atahualpa, who also sent a message from his camp some distance away that he would visit the Spaniard the following day. Thereupon Pizarro conceived a plan to seize the king, and ordered his soldiers to arm themselves but to keep out of sight when Atahualpa arrived.

Early the following morning the Inca army left the royal camp and proceeded to Cajamarca. Pizarro had with him only a handful of men and horses, but the native monarch was preceded by so many soldiers that it was almost nightfall before the last of them arrived in the city. As Atahualpa was borne before Pizarro, he was met and addressed by the friar Vicente de Valverde, who extended a cross in one hand and a Bible in the other. Valverde's words, whether intentionally or because of their faulty translation by the interpreter, offended the Inca monarch, who disdained the offerings and threw them to the ground.

At this action, Valverde, who has been depicted by many historians as a rascally trouble maker, shouted to the hidden Spanish soldiers: "Fall on—I absolve you!" In the slaughter that followed, hundreds of Indians were killed and Atahualpa was taken prisoner.

The person of the Inca king was so sacred that his capture paralyzed the nation, and in spite of their overwhelming numbers the Indians seemed helpless. Atahualpa then said that if Pizarro would release him he

DOWN THE DESERT COAST OF PERU

would fill the room in which he was confined with gold to a point as high as he could reach. This offer was accepted, and for several weeks gold was brought in great loads from all parts of Peru. The room was seventeen feet long and twenty feet wide, and the point up to which it was to be filled was designated by a red mark nine feet above the floor. The treasure was in many forms. Some of it consisted of gold plates torn from the Temple of the Sun at Cuzco. There were golden basins, drinking cups, vases of all kinds, and many objects of the finest workmanship, beautifully carved. When the room was almost filled up to the mark indicated, Pizarro ordered the Indian goldsmiths to melt it all into ingots. There was so much gold that they worked day and night for a month at the task. Then Pizarro refused to let Atahualpa go, and after a trial that was a mockery of justice had him strangled to death. A prison now covers the spot where the palace stood, and in one of its rooms is a stone that the Indians say is still stained with Atahualpa's blood.

Salaverry, not far south of Pacasmayo, is an important sugar-exporting town. It is the port for Trujillo, a city of about fifteen or twenty thousand people. Trujillo was founded by Pizarro in 1535 and was named in memory of his native town in Spain. Near by are ruins of an ancient city built by the Yuncas, one of the tribes conquered by the Incas.

There are many ruins of Indian cities scattered over the Peruvian desert, and from some of them have been dug mummies in an excellent state of preservation. The desert air is as dry and healthful as that of Egypt. As in Egypt, it is the dryness that accounts for the good condition of the centuries-old mummies dug up here. Most

LANDS OF THE ANDES AND THE DESERT

of the mummies found in Peru showed that the corpse was placed in a sitting posture, wrapped in cloth, and bound with string. During a former trip to this country I visited a number of cities from which such mummies had been dug, and I saw piles fifteen feet high containing skulls that had been taken from the excavations.

Some of the ruins in this desert are the remains of cities that were in existence long before the Incas came. In the Jequetepeque Valley back of Pacasmayo I saw a large mound that was once the site of a palace, or possibly a temple to the vestal virgins of the sun. All about were bits of pottery, moulded by the people of an unknown nation of the past. The ruins showed that the building was nearly square and five hundred feet wide at the base. Its adobe walls had been plastered on the outside with mud and washed with colour. In other parts of the desert earthen vessels have been found that are believed to have been made by a people who were old when the pyramids of Egypt were young.



Going ashore on the Peruvian coast is not usually a matter of walking down the gang-plank. It is more likely to mean being lowered from steamer deck to a tender in a chair operated by a steam crane.



The capital of Peru lies in the narrow Rimac Valley, eight miles inland from the Pacific, and one thousand feet above its level. It was founded by Pizarro only forty-three years after Columbus discovered America.

CHAPTER IX

THE CITY OF PIZARRO

CLIMB with me to the rocky top of San Cristobal and take a look over Lima, the capital of Peru. We are on the edge of the Rimac Valley, within eight miles of the Pacific Ocean, and about a thousand feet above it. From here the sea seems a wide streak of silver, beyond which are the mountainous islands that border the coast. At the water's edge is the port of Callao, and directly opposite it the island of San Lorenzo. Behind us, half hidden in the clouds, is the westernmost range of the Andes, where

In awful pride, enthroned above the skies;
Peaks upon peaks in matchless grandeur rise
'Mid frowning glaciers on whose snowy crest
The savage vulture builds its craggy nest.

San Cristobal is a bare hill of the desert, rising nine hundred feet above Lima. Its summit can be reached on foot or by an aërial tramway. On top of the hill, rising three hundred and fifty feet still higher into the air, are the steel towers of a radio station, from which messages are sent over the high wall of the Andes to the government station at Iquitos in the heart of the rubber country of the Amazon Valley, and even across the continent to Rio de Janeiro.

From the top of San Cristobal we could throw stones upon the roofs of Lima beneath us. The city is a vast

LANDS OF THE ANDES AND THE DESERT

expanse of low, flat-roofed buildings, most of them of one or two stories, above which rise a cathedral and many churches. Almost directly below us is the great round Plaza de Toros, the immense bull ring where fights are held every Sunday, and where the Limeños come by the thousands to see their favourite matadors butcher the bulls. Some of these people seem to be quite as blood-thirsty as those who watched the gladiatorial fights of ancient Rome. Only last Sunday, when the bulls were not considered as fierce as they should be, the crowd hissed the fighters and drove them out of the ring. They had even begun to tear up the seats and set fire to the building when the police rushed in and restored order. In recent years boxing and horse-racing have grown in popularity and the latter now rivals bull-fighting as a favourite sport. The Jockey Club of Lima is famous all over the west coast, and during the races that are held from July to December leaders of society, including the president and his officials, are frequently in attendance.

The winding stream that runs through the city is the Rimac River. It springs forth from the glaciers of the Andes, and gives life to the valleys below, providing water to irrigate the orchards, the vineyards, and the fields of grain along its course. Lima is built in the Peruvian desert, and the irrigated lands that surround it are scattered through fifteen small valleys. They are divided into about one hundred and eighty estates, many of which are large holdings. Practically the whole support of the city comes from this region and from its trade with the rest of Peru.

Lima was founded by Pizarro only forty-three years after Columbus discovered America. In honour of the

THE CITY OF PIZARRO

sovereigns of Spain he called it "Ciudad de los Reyes," or The City of the Kings, and it was so known for a long time afterward. The present name of Lima is a corruption of the word "Rimac," the name of the river on which it is built. The city had grown great one hundred years before the ground on which Chicago now stands was trodden by the feet of white men. It was the capital of all South America when our country was subject to England, and to-day it is one of the most interesting cities upon the two continents.

But let us go down from San Cristobal and make our way over the Rimac to the main part of the city. One of the first places we visit is the museum, which vies with the one at Cairo in its relics of a bygone civilization. Its collections of potteries, textiles, and mummies depict not only the handicraft of the Inca régime, but of the more ancient civilizations of centuries before. Side by side with these objects of antiquity are many evidences of modern Peru and its progress in commerce and industry. One of them is the remains of the first airplane to cross the Alps, in which a young Peruvian aviator lost his life.

Lima is sprinkled with great plazas or squares containing fountains and gardens, and extending out from these run narrow thoroughfares, other streets crossing them at right angles. The main business streets are not more than thirty feet wide, and the car tracks are so close to the sidewalk that one has to be careful lest he lose a leg as he walks along. Another thing that makes the visitor to Lima stay on the alert to keep his bearings is the system by which the streets are named. In addition to a thoroughfare having a designation for its entire length, each block has also an individual name.

LANDS OF THE ANDES AND THE DESERT

The buildings are close to the street, and in the residential section the ground-floor windows are barred. The houses of two or three stories have balconies that extend out over the sidewalks. Some of these balconies are so wonderfully carved that they make me think of the harem quarters of Cairo or old Spain. In the business parts of the city, where most of the stores have living quarters above them, one sees long lines of them stretching from one end of the street to the other.

Lima has practically no backyards, and only in the suburbs are there outside gardens. Most of the residences surround courts or patios upon which the principal rooms face. The larger houses cover a good deal of ground, a single one sometimes having twenty or more rooms and several large courts in which are fountains, growing plants, and even trees.

Often the rooms that do not open on the court are lighted by little dormer windows that extend up through the flat roofs and look like chicken coops. It is difficult, in fact, to tell the dormers from the real chicken coops. There are thousands of chickens that are hatched, lay their eggs, and grow fat for the kitchens on the roofs of this city. On a previous visit here I was awakened every night by the crowing of the cocks above me. There was one asthmatic old rooster that crowed me awake regularly at five a. m. and another that sometimes made the air shake at midnight. I have not yet seen a cow on the roofs, though I am told that some families have their stables so located, the cattle not being taken down until they are to be killed. Nowhere are there any chimneys to be seen. Practically all the cooking in Lima is done over charcoal, the fumes of which escape as best they



In keeping with its early name, "City of the Kings," Lima was noted in colonial times for its beautiful buildings, in which the Spanish aristocrats combined the Moorish architecture with the fine carving done by the native Indians.



Pizarro selected the Plaza de Armas as the centre of the future city of Lima, and laid the cornerstone of the first cathedral erected on this site. The present structure contains the bones of the conqueror.

THE CITY OF PIZARRO

can. During recent years electric stoves have come into use.

Many of the older buildings are beautiful and exceedingly comfortable. Some of them are constructed of sun-dried brick, and some have roofs of plaster spread over a framework of wood lathed with bamboo canes. The outer walls are covered with stucco, and such buildings have a substantial appearance in spite of their flimsy construction.

Of late many fine houses of reinforced concrete have been put up, and along the Avenue of the Exposition, for instance, are residences that would be considered fine anywhere in the world. This street is almost as wide as Pennsylvania Avenue in Washington, and has along its centre a continuous garden of flowers, shrubs, and trees. It is a popular place in the afternoon, when the sidewalks are crowded with promenaders, and processions of motors and smart carriages move along the pavement.

Lima has almost two hundred thousand inhabitants and is steadily growing. Its population and business have increased since the opening of the Panama Canal, and when it has better hotels it will be as delightful a city as one can find along the west coast. Its resorts on the Bay of Chorillos, where regattas and water sports are held each summer, are already popular places for both Peruvians and foreigners. In winter, because of the heavy fogs near the sea, many of the people go inland to Chosica, in the Andean foothills.

But let us leave the streets and go into the Cathedral. It is in the heart of the city, and its towers can be seen from almost anywhere in the Rimac Valley. It faces the Plaza de Armas with its palm trees and its beautiful

LANDS OF THE ANDES AND THE DESERT

fountains, and is said to be the finest church edifice on the American continent, with the single exception of the cathedral in Mexico City. It was founded by Pizarro before John Smith landed at Jamestown. Ninety years were taken to complete it, and although it has been damaged again and again by earthquakes, each time it has been rebuilt.

The interior of the Cathedral is impressive. The high altar is of massive silver construction, and the stalls of the sanctuary are fine specimens of the best carving done by the Indians when that art was still in its prime. On the walls are fine paintings by Murillo and other masters, and the chapels are of exceeding beauty.

I was especially impressed by the chapel of Pizarro. The little verger of the Cathedral took me into it, and under the altar he showed me the coffin in which lie Pizarro's bones. The casket is of white marble with glass sides and top. The verger lighted a candle and waved it up and down over the glass, and as he did so I could see all that is now left of the first Spaniard to explore and conquer the west coast of South America. His skeleton, which is as black as old mahogany and looks as though it were varnished, lies upon a red velvet cushion embroidered with gold. The skull, which rests on a pillow, is fastened to his backbone by wires through the ears. The jaw is a trifle drooping, the nose is prominent, and the great eyeless sockets stared up at me as I gazed down through the top of the casket. As I looked more closely the whole seemed merely a shell. The shins have begun to peel, showing the honeycombed structure of the bone beneath. I am told that in times past pieces have been cut off and given to relic hunters, but as far as I could

THE CITY OF PIZARRO

see, most of the skeleton is intact, though decidedly leathery and the worse for wear. From the outside of the coffin I copied these words:

Capitan General Don Francisco Pizarro, Fundador de Lima en 18 de enero de 1535. Muerto en 26 de junio de 1541.

It was on the latter date that Pizarro was murdered by followers of his former partner, as a result of a quarrel over the division of the Inca territory.

Lima has seventy churches in all, and nearly every one is worth visiting. The church and convent of San Francisco are said to have cost two million dollars. The altar of Santa Rosa, the patron saint of Lima, had in it at one time fifteen hundred pounds of gold and silver, and jewels that included fourteen hundred diamonds, twelve hundred emeralds, six hundred rubies, and one hundred and twenty fine pearls.

Lima appears to be a godly city although there is a Methodist bishop here in my hotel who says it is the most bigoted on earth. There are priests and nuns everywhere, and great monasteries and convents galore. Most of the people are devout churchgoers, and on Sunday morning the streets are filled with families on their way to mass. Although on other days the women wear as gay apparel as in our own cities, many of them attend Sunday services clad all in black. The usual head-dress is a black cloth or lace mantilla, covering the hair and the neck so that only the face is visible. I am told that in some churches women are not supposed to enter wearing a hat and that those who do so are tapped with a long stick by the sexton and told to remove their headgear. The men sit by themselves on one side of the church and the women have their seats on the other.

LANDS OF THE ANDES AND THE DESERT

I find that there is a great movement going on in this country for freedom of religious worship. Laws have been passed by the national congress making it possible for any person to establish any kind of church anywhere he pleases. Previously, the Protestant missionaries had not been permitted to introduce their religion in the interior. Women also are demanding a greater freedom and are beginning to take their places in the business and professional world. One woman has organized a sort of nursery hospital for children, and another has opened a woman's exchange, where needlework and other articles may be bought and sold. Many are teachers, and hundreds are stenographers and typists. The changing idea regarding the feminine sex was reflected in a much-talked-of float at the celebration of the Peruvian centennial. It was called "The Lima that is Passing," and showed, among other things, a señorita wearing her black manta peering out from behind the shelter of her barred balcony windows.

Girl students are now enrolled in the University of San Marcos at Lima, the oldest in all America, which was founded a century before Harvard. It was modelled after the ancient University of Salamanca, and though it has been destroyed again and again by earthquake and siege, it stands to-day as the foremost institution of learning in Peru.

Near the Cathedral and facing the Plaza is the national palace, where I called upon some of the government officials. It was built about the same time as the Cathedral, and has all the features of Spanish architecture in the days of Columbus. It covers a whole city block, and has several patios in which are royal palms and tropical



Monuments to liberty, and mounted constabulary to preserve it, are characteristic of Peru, which, like other South American republics, has experienced more than one revolution since it won independence from Spain.



In the chamber where Peruvian senators now deliberate upon the welfare of the republic, the black-robed officers of the Spanish Inquisition once sat in solemn session and sentenced luckless heretics to imprisonment and death.

THE CITY OF PIZARRO

flowers. On my way in I was shown a fig tree said to have been planted by Pizarro. It is more than three hundred years old and is still bearing fruit.

The government palace formerly contained the residence and offices of the president of Peru. I have interviewed two presidents of this country, and have talked with them about its progress and development. Not long ago the government brought in experts from the United States to assist in formulating new methods of administration. As a result, improvements in the national commercial and educational systems have been effected, sanitary conditions bettered, and police, customs, and harbour regulations revised.

The president is elected by a direct vote of the people for a term of five years. He has a cabinet of five members. The legislative branch of the government is divided between a senate of thirty-five members and a house of representatives of one hundred and ten. The senate occupies a building on the Plaza Bolivar that was once the seat of the Spanish Inquisition, and in front of which hundreds of victims were executed and burned to death. The interior of the Inquisition chamber is lined with beautiful woodwork, the ceiling especially being noted for the rare and intricate designs of the carving. In contrast to the Old World beauty of the room is an interesting and up-to-date device by which members vote on questions before the senate. Each desk is equipped with an electric button, which, when pressed, registers the vote at the presiding officer's table.

CHAPTER X

IN THE SHOPS AND MARKETS OF LIMA

I HAVE just returned from a morning in the city market of Lima. I arrived at the market house at seven o'clock and ate my *desayuno* at a little restaurant among the stalls. This meal, which the Peruvians eat upon rising, consists of two small pieces of toast and a cup of coffee or tea. The real breakfast is not eaten until eleven or twelve o'clock. Being afflicted with a good American appetite, I pieced out this scanty menu with a bunch of white grapes as big as my head, the grapes themselves being the size of damson plums.

The table was large and I had hardly taken my seat before an Indian woman with a broad-brimmed Panama hat coming well over her bronzed features sat down opposite me and ordered some ice cream, which was served in a champagne glass. Then a pock-marked Peruvian of the lower class took a seat at the table, and just as I was about to leave, a fat old Negress, wearing a black manta that covered the entire upper part of her body and all of her head except her face, slid down into a chair beside me. While eating, I was besieged by all sorts of peddlers, from women who offered me lottery tickets to men who were selling waxen images of the Virgin Mary dressed in the latest styles.

All about were the queer characters that make up the masses of the Peruvian capital. There were cooks by the

IN THE SHOPS AND MARKETS OF LIMA

hundreds doing their daily marketing. Some were Chinese, some Negroes, and many had the yellow skins that showed their combined Indian and Spanish ancestry. There were scores of women dressed all in black, and many in calico dresses and straw hats. Not a few were mountain folk, and they looked about with eyes of wonder at the strange sights of the great city. The crowd numbered thousands, and was the busiest assemblage I have seen in Peru.

The Lima market covers a city square, the chief stalls being in a great court roofed with galvanized iron and surrounded by stores. As I strolled among the fruit peddlers I saw white and red grapes, apples as yellow as gold, and rosy peaches, as well as pomegranates, guavas, and tunas, the fruit of the cactus. There were oranges, lemons, pineapples, and bananas, and bushels of alligator pears. The latter cost only five or ten cents each, yet I had to pay fifty cents for the one I ordered with my dinner at the hotel yesterday.

Among the vegetables were string beans as long as my arm and yuccas as big around as a baseball bat and often two feet in length. They are the roots of a species of lily plant and are eaten like potatoes. I saw roasting ears at nearly every vegetable stand. Some of them were bright yellow and others as black as my boots. I saw grains of hominy twice the size of the largest lima beans. They come from a corn grown here that is so mealy that the Indians make flour of it by pounding it with a stone. There were many tomatoes, great heads of cauliflower and cabbage, muskmelons and watermelons, and other fruits the names of which I do not know.

A large part of the market is devoted to meats and game.

LANDS OF THE ANDES AND THE DESERT

I saw lamb, kid flesh, and great cages of guinea pigs, which when cooked taste like squab pigeons or tender young squirrels. There were stalls full of corbina, which is a large and sweet-fleshed fish not unlike the bluefish of the Atlantic, though of a more delicate flavour. A certain variety of Peruvian fish is considered especially delicious when served raw with the juice of a lemon. The acid seems to have the same effect on the flesh as boiling, and it is thought even better than the raw fish eaten in Japan. There are also many kinds of shell fish, including a clam called the *señorita*. Its flesh is as white as snow except for a morsel of meat the colour of the brightest red pepper. About the only sea food I have eaten here that I do not like is the Peruvian oyster, which is parboiled and served on the half-shell.

There is no place that I have yet visited that has so much pepper and potatoes upon its tables as I find here. It is said that the Peruvians eat more pepper than salt. They serve it with nearly everything, and one always finds beside his plate a little dish of a sort of red pepper paste called *aji*. *Papas con aji* is a favourite concoction made of potatoes and pepper with a sauce of tomatoes and eggs. It is as hot as fire, but not bad after you get used to it. *Papas rellena* is made of mashed potatoes mixed with olives, onions, eggs, and raisins, and fried. *Papas con arros* is potatoes cooked with rice. The chief meal of many of the poorer class of people is a soup made by cooking together nearly every kind of vegetable and a goodly portion of meat. The soup is drained off and served clear, and the vegetables and the meat are brought in on a separate plate to be eaten afterward.

Peru, it seems to me, is the paradise of the housekeeper.



Lima does most of its business on the ground floor, the upper stories of the buildings along the Mercadero being devoted to living quarters. Many of them have handsomely carved balconies and galleries.



One of the pleasures of a visit to Peru is eating its delicious fruits, many of which are not grown in our country. Panniers slung across a burro's back provide the native substitute for our push-carts.

IN THE SHOPS AND MARKETS OF LIMA

There are few places where it is easier to manage a home than here. The cooks do all the marketing, the ladies of Lima seldom going out of the house except to shop or visit. The cook is allowed a certain amount of money a day, for which he is expected to supply the meals. In other words, you board with your cook. If you have a good one, you are better and more cheaply served than if you try to manage it all yourself. At the same time, the cook usually makes a profit from the marketing allowance in addition to his wages. Servants are cheap in Peru. The native families pay less than the foreigners, and in the country districts there are many house servants who do not get much more than their board and clothes.

Outside of the market much of the peddling of Lima is done by women, who ride on horseback from house to house. Nearly all the milk is carried in cans tied to the sides of a horse, upon the back of which the woman sits with her legs straddling the animal's neck. When she reaches a house where she has a customer she slides down over the horse's neck, lifts off one of the cans, carries it inside, and pours out a quart or a pint, according to order. There are also many women vegetable peddlers. Other peddlers are men and boys who sit just in front of the tails of their donkeys with their backs against their loads of goods. There are no huckster wagons, and the drays of the city are long-bodied two-wheeled carts, each pulled by three mules abreast.

In the chief shopping section only the newest of the stores have plate-glass windows, and there are no fancy fronts with gorgeous displays that may be looked at Sundays and evenings. Most of the stores have no windows at all. They are shut in from the street by great

LANDS OF THE ANDES AND THE DESERT

doors that are removed during business hours. The sunlight comes in through the door or from the roof. The shops are separated only by thin walls, and strolling along in front of them is like walking through a museum or an Oriental bazaar. The sidewalks are narrow and the merchandise is displayed close to the streets. Many of the dry-goods stores hang fancy patterns of cloth from the ceiling, and the larger establishments have piles of goods stacked upon the floor near the street. Notions of every kind are hung from strings stretched from wall to wall, and all sorts of unusual ways of display are contrived. As a rule, the prices are high. The best from all over the world is brought here for sale, for this city, while not a rich one, has thousands of well-to-do people. They make as many trips to Europe as do our own wealthy families, their children are educated abroad, and the women frequently go to Paris to buy the latest styles in clothes.

The chief shopping hours are from four to six o'clock in the afternoon. Then the streets are thronged with men and women, and the crowd is as great as that on F Street in Washington at about the same time of day. One difference here is that no one is in a hurry. The people saunter along or stop and chat with their friends. Nearly everyone is well dressed, and nearly every man, old and young, carries a cane. There are many women wearing the fashionable styles of to-day, and there are also many who are clad in the dead black that the lady of Lima of the past always wore when she went out to walk. Such women do not wear hats, but instead wrap a shawl of fine black goods about the head, pinning it back so that the face alone shows. This background adds to their beauty,

IN THE SHOPS AND MARKETS OF LIMA

and the costume is more becoming than the changing fashions.

There is no business done in Lima on the Sabbath. The stores are closed and the great doors fastened with padlocks. There is not a sign of goods of any kind to be seen. Sometimes there is a grating at the top of the door for ventilation, and sometimes a round hole has been made lower down so that if the owner is within he may look out; but there is no sign of business anywhere. This is so also in the evenings of week days. Nearly all the stores close at six o'clock, and after dark the streets are almost deserted, except near the movies. The barricades in the past have protected the merchants' stocks in times of political disturbances and revolutions.

I find American goods for sale in all the stores, although the merchants are mostly English and German, with some Peruvians and a number of Chinese and Italians. The hardware stores carry American axes, hatchets, and other tools, and there are many agencies for American machinery. Much of the cotton print cloth comes from our country, and American canned goods have a great sale here. If I want to pay high prices, I can buy a pair of shoes made in the United States, or one of our American hats sold in competition with those from England and France. The Peruvians have mills not far from Cuzco where they are turning out blankets and underwear, but most of their other woollens still come from abroad. Just now the stores are showing more and more goods from Germany, which is successfully reëstablishing its pre-war market in Peru.

An American enterprise that is doing much for our trade with Peru is the publication of the *West Coast Leader*, a

LANDS OF THE ANDES AND THE DESERT

weekly paper printed in English here in Lima. This journal is devoted to opening up Peru to English and American capital and to the pushing of foreign trade. Its editor was for a long time a newspaper man in the United States.

At the present time the chief North American firm doing business on the west coast of South America is the house of W. R. Grace and Company. It has its head offices in London and New York, with branches in Peru, Bolivia, and Chile. This company, which has been operating here for more than a generation, deals in all kinds of merchandise, from a small package of goods to rolling stock for a railroad, and it handles big contracts involving millions of dollars. The Graces have long run a line of steamers from New York to western South America. The company is known everywhere for the ability and probity of its officials and members, and it is an institution of which the United States may well be proud.

Another opportunity for American capital down here is in the establishment of a line of first-class hotels along the west coast. There should be one at Guayaquil, another at Quito, and a third at Lima. Since the opening of the Panama Canal there has been a great increase in tourist travel to this part of the world, but at present the hotel accommodations are, to say the least, very poor, and the rates are about as high as at home.

I have been stopping here at the Maury, one of a chain of a half-dozen hotels under the same ownership. It vies with the Grand as the best hotel in Peru. It is a great two-story structure with wide balconies. The best accommodations I could get were a room facing the street and, back of it, a little dark sitting room. There

IN THE SHOPS AND MARKETS OF LIMA

are no private bathrooms. Yet the Maury is usually filled and I understand that it is paying big dividends.

The port of entry for Lima is the coast city of Callao, which for all practical purposes has become the "down-town" district of the capital, as many of the Limeños have their places of business there. When Pizarro founded the City of the Kings he selected a site far enough from the sea to be safe from buccaneers and pirates, yet only eight miles from a fairly good harbour on the west coast. The first settlement, which was afterward destroyed by an earthquake and a tidal wave, lay to the north of the present city. Here, on the tower of the castle of San Felipe, was the last place on the American continent over which floated the flag of Spain, the royalist troops having made their last stand here during the War of Independence.

Callao lies on a bay shaped like a great half-moon and guarded by rocky islands. Part of the harbour is further protected by a stone mole built out into the bay. Just opposite Callao, lying parallel with the coast and less than three miles away, is the island of San Lorenzo, which some day, according to present plans, will be joined to the mainland. The water between the southern end of this island and the coast is shallow, and by building a breakwater the two can be united to make a deep anchorage basin entirely protected from the sea, and large enough to hold any of the great fleets of the world.

Callao has a large dock at which steamers and sailing vessels can discharge their cargoes, although many of the ships do as mine did and anchor out in the bay, landing their freight and passengers in smaller boats. As I went ashore at Callao I counted forty sailing vessels, loaded with lumber from Puget Sound, and with grain, rice, and

LANDS OF THE ANDES AND THE DESERT

other heavy cargo. There were also many steamers, some Peruvian, some Chilean, and some from the United States. I saw a British boat of twelve thousand tons starting out for Europe, and a Japanese liner from the Far East. Among the curious craft were three little war vessels of the Peruvian navy and two submarines. Each year about fifteen hundred steam and sailing vessels call at Callao. It is the port of entry for many of the imports into Peru and the outlet for the copper produced in the famous Cerro de Pasco mines high up in the Andes.

On the dock I bargained with a *cholo*, or half-breed Indian, to take my eight pieces of baggage to Lima. They were loaded upon a mule cart and transferred to the tramway, by which they were carried to the capital, and thence by cart to my hotel. I rode to Lima by trolley, first passing through one of the wide streets of Callao. It was lined on both sides with trees, back of which stood low, flat-roofed buildings, built in blocks and painted in all the colours of the rainbow. Some of the streets were clean and modern but many were dirty and smelly. For a long time a common practice was to put garbage on the roofs and in the streets, where flocks of vultures acted as scavengers. These birds were protected by law, severe penalties being imposed on anybody who killed one of them.

After leaving the city we passed through orchards, gardens, vineyards, and fields of sugar cane and grain, surrounded by mud walls as high as my waist. The fields were irrigated by water from the Rimac River, and their bright green was refreshing in contrast with the barren mountains above. For much of the way we rode between rows of willow trees from which branches are cut off every year to make wicker baskets.

CHAPTER XI

ON THE WORLD'S HIGHEST RAILROAD

AS I dictate these notes to my secretary we are both seated on an oil-burning engine on the very top of the Andes. The air is so thin that I can hardly talk, and even the roaring fire in the furnace beneath us does not take the chill from our bones. We are a short distance from Ticlio and near one of the highest railroad passes of the world. We are higher in the air than any mountain in the United States outside Alaska. We are one hundred feet above the top of Mont Blanc and two thousand feet higher than the sacred peak of Fujiyama, in far-off Japan. If I could fly from here in an airplane north to Pike's Peak I would have to drop three times the height of the Washington Monument before I could land on the summit of that mountain, and if I descended one thousand feet farther I would still be far above the height of Mount Mitchell, the highest peak in the Appalachians. Our actual altitude is 15,665 feet above the sea, and all about us are mountains that rise several thousand feet higher. Over there is Mount Meiggs the altitude of which is more than seventeen thousand feet, and not far away is another mountain of twenty thousand feet elevation.

We seem to be in a great fortification on the roof of the world. We are in a basin surrounded by gigantic walls of blue, black, white, red, and gray rock. We are also in

LANDS OF THE ANDES AND THE DESERT

a vast garden of glaciers. From where I am sitting I can count a half-dozen mighty rivers of ice, some of them so near that by standing up in the cab I could almost throw a stone to them. These glaciers are of enormous extent. I can see one that seems to cover the whole top of the mountain; and near it another has burst out of the rocks and, like an icy shroud, has dropped itself down to the valley.

A moment ago the sky was bright blue. Now the wind has come up and the clouds hang low over the darkened ice. On these mountain heights the sun of the tropics fights with the cold of the highlands in an endless battle. One can never be sure of the weather. It may be clear for a week or it may snow day and night. In the winter the mountain blasts are so fierce and the glare is so great that the trainmen have to wear smoked glasses to keep from becoming snow-blind.

This road is known as the Central Railway of Peru. It belongs to the government and is under the management of the Peruvian Corporation, a British company that operates more than half of the railways of the republic. It runs from Callao on the Pacific to Oroya high up in the mountains, a distance of one hundred and forty miles. There the road turns south to Huancayo, seventy-eight miles away. It is planned to extend that line on to Cuzco, the ancient capital of the Incas, and already forty or fifty miles of track have been laid beyond Huancayo. From Ticlio, the highest point on the main line, a branch nine miles long goes to the Morococha mines, crossing the range at 16,805 feet, the highest point reached by any standard-gauge railway in the world.

The Central Railway was suggested by a Peruvian, but



With one of the largest and safest harbours on the west coast of Peru, Callao has been the chief port of the republic ever since the days when the treasure ships sailed from here for Spain laden with silver and gold bullion.



The highest railroad in the world climbs up over the Andes by following the course of the Rimac, using tunnels, switchbacks, and even turning aside the river itself to reach the topmost point, 15,665 feet above sea level.

ON THE WORLD'S HIGHEST RAILROAD

the man who laid it out and constructed the greater part of it was Henry Meiggs, an American. Meiggs raised the money to build it, and, in fact, he is entitled to most of the credit for its construction. He began work on it in 1870, and in 1876, when he died, it was completed as far as Chicla, a point more than two and a half miles above the sea. By that time the twenty-seven or twenty-eight million dollars that he had raised for its construction had all been spent and the work stopped. It was resumed some years later, and in 1893 was completed to Oroya. The extension to the rich valley of Huancayo was finished about fifteen years later.

The road was originally planned to reach the rich silver and copper mines of Cerro de Pasco, but it was not until some years later, when the mines were bought by an American syndicate, that a line was built from Oroya northward along the high plateau of the Andes to that mining centre. This railway is ninety miles long, and, with the Oroya-Huancayo section, covers a part of the Pan-American Railway route, which is planned some day to span the entire ten thousand miles from New York to Buenos Aires.

The Central Railway of Peru is considered by experts the most wonderful piece of railroad engineering on earth. It climbs mountain sides that rise almost straight up out of the sea. As the crow flies, the distance from the Morococha Pass to the ocean cannot, I should say, be fifty miles, yet with all its windings, with its loops, twists, and turns, its zigzags and its tunnels, and the other contortions by which it climbs up the mountains, the rail line is only about one hundred miles long. It makes the whole distance and the great elevation without the rack

LANDS OF THE ANDES AND THE DESERT

and pinion or cog systems used on other mountain railways, and with a grade of only about four per cent. There is not one inch of down grade from the sea to the top, and there is no place where a train or a car, if left on the main line, would not roll by gravity down to the ocean. As I have said, the track is of standard gauge, and the rolling stock used is largely of American manufacture. The engines burn fuel oil, so that the journey throughout is accomplished without dust or cinders. The cars are equipped with an elaborate system of brakes, which assures safety, and in the descent a pilot engine always goes in advance of the train.

Let me compare this line with some of the other famous mountain railroads of the world. The Denver and Rio Grande narrow gauge in Colorado reaches a level of 10,800 feet at Marshall Pass, but in doing so it starts at a mile above the sea in the foot-hills of the Rockies, and after going some hundreds of miles through the gorges it has attained an altitude that is still a mile lower than the highest rail on the Central. The highest point of the Transandine road, which crosses from Chile to Argentina, is not more than two miles above the sea. In Africa, the Uganda road, which, beginning at Mombasa on the east coast, goes over the divide to Lake Victoria, is several thousand feet lower. Between breakfast and dinner the Central Railway of Peru takes one from sea level to a point higher than the top of any mountain in the United States outside Alaska, and if your heart can stand the strain and keep off the *soroche*, or mountain sickness, you may ride in comfort all the way up.

The ranges crossed by the Central Railway form one of the mightiest mountain systems on earth. The long

ON THE WORLD'S HIGHEST RAILROAD

chain of the Andes walls the entire western side of this continent. It begins at Cape Horn and the fiords of the Strait of Magellan and stretches northward in a great winding rampart for a distance of forty-five hundred miles, where it drops down into the Panama Canal. Throughout most of its length it has peaks three or four miles in height, and its average elevation is more than twelve thousand feet, or almost the height of Fujiyama. Mount Aconcagua, in Chile, the tallest measured peak in South America, is about twenty-three thousand feet high, and Mount Misti, in southern Peru, is more than twenty thousand feet above the sea. North of here, in Ecuador, you will remember that we saw many volcanoes, including Chimborazo, more than four miles in height; and to the south in Bolivia is a plateau that has an average elevation of practically thirteen thousand feet, with no drainage to either the Atlantic or the Pacific. These great altitudes are the most impressive on account of the steepness of the slope of the range that runs along the coast. It begins right at the sea, only a narrow strip of sand separating it from the ocean, and it jumps, as it were, into the clouds.

The Central Railway follows the valley of the Rimac. In places the road is high above the river, clinging to the sides of the hills, again it is on the river level, and at one point, where the space was not wide enough for both road and river, the engineers made a tunnel through the mountains and turned the stream out of its course in order to use its bed for the track. There are sixty-five tunnels and sixty-seven bridges, and there are sixteen switchbacks located on the sides of mountains that the engines could climb in no other way.

LANDS OF THE ANDES AND THE DESERT

During the first part of the journey the train took me through an irrigated valley. There were fields of alfalfa, sugar cane, and other green crops on both sides of the track, but the mountains towering above were as arid as the Sahara. I remembered the difference between the two sides of the Andes, and thought that if I could bore a hole through the mountain wall I might come out into the valley of the Amazon, where the waters swarm with turtles and alligators, and the land is covered with a dense jungle of palms, rubber trees, and all sorts of tropical fruits.

Near the ocean on the western or arid side of the Andes there is no green at all. The mighty rocks seem absolutely bare. By looking closely, however, I found gray cacti clinging to the rocks and silver-gray moss covering the stones like a mantle. These plants are probably fed by the dews. It was not until I reached Tamboraque, at an altitude of almost two miles, that I found the first sprinkling of green, which grew fresher and more abundant as we ascended. At two and a half miles above sea level the rocks were covered with a thin grass, and where I am now, at the beginning of the great plateau, there is plenty of feed for llamas and sheep. During the last three or four hours we passed many wild flowers. At one place I counted forty varieties, and from where I am sitting I can see buttercups and great yellow dandelions.

As the train climbs the slopes the Rimac Valley narrows and widens. In some places one could almost jump from one side of it to the other and again it is so wide that it would take a half hour to walk across it. All through the valley are patches of crops. Near the ocean it is quite wide and there one sees cattle and sheep. There are some



Indian villages of rude thatched huts are perched on the mountain
sides along the line of the Central Railway. In the narrow valleys every
spot of land is cultivated or used for grazing a few sheep or cattle.



Not far from the Viscas bridge, near the crest of the Great Divide, one may toss a cork into each of two streams, one of which flows into the Pacific, while the other crosses a continent and empties into the Atlantic.

ON THE WORLD'S HIGHEST RAILROAD

large fields with mud walls about them, and also haciendas with comfortable buildings. All the farms are irrigated. As the train went farther into the mountains the fields grew smaller and smaller; some were terraces where the cultivated strips were often only three or four feet wide. Nevertheless, these little farms extend far up the mountains, which are so steep that a workman who fell out of a field the other day rolled down fifty feet before he could stop himself. Even higher than these cultivated patches are the marks of other terraces that were used by the Incas, who tilled a hundred acres where the modern Peruvians till one.

All the way from the ocean to the top of the Andes I passed towns and villages. Twenty-five miles from Lima, at an altitude of three thousand feet, I stopped at Chosica, a summer resort, where a score of huge *chola* women, clad in short skirts and shawls and white Panama hats, were on the station platform, selling oranges, tomatoes, peaches, watermelons, and strawberries. I bought six oranges at three cents apiece, and paid a nickel for an alligator pear that weighed a pound.

Higher still, we came to the Indian towns. There all the houses were of one story, most of them being rude stone huts with rough tiled roofs. The people do not build their homes in the fields, where every foot of land is needed for crops. Instead, they huddle together out on the edges of the valleys or on the rocky places close to rivers. They go out to work on the terraces and patches of soil, and now and then I saw them driving over the trails their llamas loaded with burdens. Here they were herding sheep while standing up and spinning wool, and there they were bent double in digging the soil. These

LANDS OF THE ANDES AND THE DESERT

Indians are short and copper-coloured, and to me they looked worked to death.

The train stopped at Matucana for dinner. There we were served with plates of soup containing chunks of meat as big as my fist and a half-dozen vegetables all stewed together. We had also beefsteak and eggs and red strawberries fresh from the vines.

Here and there along the route were mining towns. Much of the ore, which contains silver and copper, is brought in on llamas, and I saw hundreds of those little camel-like beasts trotting along with their heavy loads.

Thirteen thousand six hundred feet above the sea is Casapalca, and the climb from there to Ticlio is more than two thousand feet. Just below Ticlio is the Galera tunnel, which goes through Mount Meiggs to the farther slope. From here one can throw chips into waters that flow to both oceans. I knew of this, and had prepared two bottles, tightly corked, with messages in them. I put one bottle in each stream and set them adrift. One floated away down the eastern side of the Andes. It may reach the Ucayali, one of the tributaries of the Amazon, and go on its long voyage of three or four thousand miles into the salt waters of the Atlantic. The other bobbed along rapidly toward the Pacific. It will soon reach the Rimac River, and if it escapes the rocks it will be at Callao in something less than a hundred-mile journey.

From Ticlio it is only a short run to Oroya, where the main line of the railway turns south to Huancayo, and travellers going on eastward must continue their journey by horse or muleback. An automobile road runs from Oroya to the towns of Tarma and Merced, and from there a trail drops down into the tropical valleys where there are

ON THE WORLD'S HIGHEST RAILROAD

large coffee and sugar plantations. Between Tarma and Merced the highway is strictly a "one-way" road. It is cut out of the sides of the mountains and is so narrow that two vehicles cannot pass; hence travel is eastbound one day and westbound the next.

Oroya is not a great distance from the tributaries of the Amazon River, and the day will probably come when this road will form a part of a railway route across South America. It has been estimated that the road could be extended to the navigable Amazon system for something like fifteen or twenty million dollars. Some claim that the cost of pulling trains over the great ranges will make this route impracticable for the movement of heavy goods over the Andes.

There is no doubt, however, that East Andean Peru will eventually have railway connection with the Pacific. There are several passes much lower than that at Ticlio, and there is one where the altitude is below that of Mexico City. It can be reached by an extension from one of the valleys of northern Peru, and the road built thence to the Amazon. The distance from the Pacific by this route would be only four hundred miles, or less than the trip from Boston to Baltimore. Another plan is to extend the Cerro de Pasco line to the Ucayali River, a distance of a little more than two hundred miles. I have already spoken of the possible extension of the railroads in Ecuador to the Amazon Valley, and it will be readily seen that if any of these projects are carried out, the vast region of the eastern Andes will some time be accessible to us through the Panama Canal.

In addition to one or more lines connecting the west coast with the navigable rivers of eastern Peru, the railway

LANDS OF THE ANDES AND THE DESERT

development plans formulated by the government include two longitudinal railways. One of them is to follow the line of the coast, through the desert and the oases, and the other to be high up on the plateau, running northward from Cerro de Pasco and southward to meet the railway that now reaches Cuzco from Arequipa. Much of the government railway thus far constructed has been financed by the income from the tobacco tax.

Almost all of trans-Andean Peru lies within five hundred miles of the Pacific Ocean. When the existing railroads are extended as planned it can be reached from New York in fifteen days. As it is now, it takes three weeks by ocean and river steamer to get to Iquitos, the port for eastern Peru, near the headwaters of the Amazon.

Iquitos is the capital of the great Peruvian province of Loreto, which occupies most of Peru east of the Andes. It is the commercial headquarters of the Putumayo rubber region. Although more than twenty-three hundred miles inland from the Atlantic, it is one of the chief rubber ports of the world, and exports thousands of tons every year. The Amazon here is three miles wide, and at the half-million dollar floating wharf of Iquitos may be seen many ocean-going vessels as well as smaller river craft of all kinds. Next to rubber, the chief export is ivory nuts, which, as in Ecuador, are brought in on rafts and small boats over the network of streams. Many cedar logs also are shipped from here, to be made into pencils and chests and boxes in the United States.

Iquitos is a city of fifteen thousand people, and has modern business buildings, houses of brick and concrete, and four public schools. There is a comfortable three-story hotel that is among the best in Peru, and although



Until the jungles and streams of eastern Peru are conquered by the builders of highways and railroads, the pack mule and the llama will hold their monopoly of transport service in this part of the world.



From three things the Indian woman is virtually inseparable—her hat, her shawl, and her baby. She is equally attached to her skirts, which she never changes, simply putting on new ones over the old as fast as she can acquire them.

ON THE WORLD'S HIGHEST RAILROAD

the city is but a few degrees from the Equator, the water and sanitation systems make it comparatively healthful for foreigners.

Trans-Andean, or Amazonian Peru, as it might be called, has an area equal to fifty states the size of Massachusetts or ten as big as Ohio or Kentucky, and the region has proportionately more good land than any of those states. Although near the Equator, it has a climate that varies from the temperate to the tropical. Coffee and cacao can be grown in the mountains, while the lowlands produce rubber, and there are vast tracts where sugar cane, tobacco, and cotton can be raised. The country is also rich in minerals, and much of the gold of the Incas came from there.

CHAPTER XII

CERRO DE PASCO

I WANT to give you some pictures of Cerro de Pasco, the highest mining town of the world. It is situated here on the top of the Andes on the very roof of South America, at an altitude of fourteen thousand two hundred feet above the sea. It is three or four thousand feet above Leadville, and almost twice as high as Mexico City. It is more than twelve hundred miles south of the Panama Canal and something like three thousand miles from the Strait of Magellan.

I came here from Oroya over the line built by the Cerro de Pasco Copper Corporation, which owns the great mines. The rails are made of American steel and the ties are of Oregon pine. The track is as smooth as that of the New York Central from Buffalo to Albany, and the comfortable cars were built in the United States. The bridges came from the American Bridge Company at Pittsburgh, and the locomotives are Baldwins or Rogers. The engineers and the conductors on the road are Americans, but the firemen and the labourers are Indians and *cholos*, that is, people of mixed Spanish and Quichua blood. I am told that the road paid for itself within the first two years after building, and that its traffic steadily grows.

Cerro de Pasco lies in a valley between two mighty ranges of snow-capped mountains rich in minerals. It is just about as far south of the Equator as Panama is north

CERRO DE PASCO

of it, but at this altitude of almost three miles the climate is like that of southern Canada. There are frequent snow-storms in the winter, when at night the thermometer goes down almost to zero. In the summer it rains in the afternoons, but the mornings are clear, and for about six months of the year the sun shines all the day through.

The town has about fifteen thousand *cholo* and Indian inhabitants, most of whom live in one-story houses made of plastered adobe, and a small number of whites. The buildings are in blocks, walling the streets, and are painted in bright colours. One house may be a brilliant green, the next blue, and the next red or golden yellow or white. As I walked through the town, I observed that the woodwork was freshly painted, and the American mining official who was with me told me that the law requires that the street front of every house must be painted once every two years. If it is not, the owner is fined. He said that the painting time had just passed, and therefore the city looked fresh.

The houses have roofs of tile or galvanized iron that extend out over the sidewalks. There are no eaves-troughs, and when it rains the water usually pours off the roofs down the back of one's neck. The sidewalks are narrow, and the principal roadways are paved with cobbles with a gutter of slabs about ten inches wide and six inches deep running through the middle of the street. The streets all slope to the centre, and the sewage runs off through this gutter.

The most important buildings of Cerro de Pasco face upon a plaza. As I went through it I saw about one hundred and fifty llamas resting on the stones. Each animal had a package of ore strapped to his back. As I

LANDS OF THE ANDES AND THE DESERT

looked, some of the llamas got up. They rest much as camels do, putting their knees under them and lying flat on their bellies. Many of them were chewing their cuds, and I could see their jaws moving back and forth, showing their teeth. Some of the llamas were white, others brown, and some were spotted like a calico pony, with black, brown, yellow, and white. These beasts of burden are as observing as a fox terrier, and continually turn their heads this way and that for every new thing in sight. Their wool looks like that of the Angora goat, but is coarser. It is used chiefly by the natives, and is not exported.

Strolling up the main street, I passed the principal stores, which are filled with goods from Europe and the United States. I saw canned fruits from California, salmon from Oregon, cotton cloths from Massachusetts, and sewing machines of well-known American makes. There were also many articles of native manufacture, such as ponchos made from the hair of llamas and sheep, rude sandals used by the Indians, and shoes so clumsy that they could not have come from Massachusetts. Over some of the doors I noticed tassels and fringes of tissue paper, which I was told were the signs of saloons selling *chicha*, the native drink.

The crowds in the streets were typical of highland Peru. There were Peruvians of the upper classes dressed as we are, scores of *cholos*, and Indian men and women who had driven their llamas in from the country loaded with vegetables and other native merchandise. There were many *cargadores*, or porters, with great loads on their backs, and Indian women and girls wearing huge hats on their heads, shawls around their shoulders, and volumi-

CERRO DE PASCO

nous skirts. I am told that neither the *chola* nor the Indian woman ever changes her skirt. She puts one on and keeps it there until it is worn out. As each grows thinner, she adds another, until at last she reaches enormous dimensions. She wears her shawl and hat indoors and out, and it is difficult to persuade a servant girl to remove either while at her work.

The Indian men and boys wear coarse suits of clothes that are made in the same sizes for children and grown-ups. They have ponchos and hats but no shoes; some wear sandals but many are barefooted. The streets swarm with children, and nearly every woman and girl has a child tied to her back. Sometimes the baby is on the outside of a burden, and it bobs up and down as the mother carries the heavy load over the road. She bends half double as she goes along at a sort of dog-trot.

Few of the women are handsome, and they all look dirty and rather repulsive. They start carrying burdens while they are children, and I see girls no taller than my waist with babies strapped to their backs. The men carry enormous weights up hill and down. Their chief strength is in their backs, and they have to get under a load to carry it. At one place I saw eight of them moving a piano. They did not raise it with their hands, but tied ropes to its legs and then pulled on the ropes over their shoulders until they were able to lift the instrument to their backs. After that they trotted on up the hill.

The foreign colony of Cerro de Pasco is quite as interesting as the native. Here, more than three thousand miles south of the United States and almost three miles above the sea, is an American industrial centre. I call it American because it is run by American money; but,

LANDS OF THE ANDES AND THE DESERT

in fact, the salaried employees come from all over the world. There are English, Australians, Germans, Austrians, Irish, and Danes. There are graduates of Massachusetts "Tech," of McGill in Canada, and of the leading universities of Europe—in short, the experts of a half-dozen different nations. Many of them have their families with them, and I have yet to meet a man or a woman who is not pleased with the conditions here. The Cerro de Pasco Copper Corporation does everything it can to make life agreeable, and the people live almost as well as at home.

Hotels with bathrooms and all modern conveniences have been put up for the bachelors. The married employees have comfortable stone cottages and can buy many of their supplies at the company store. There are club-houses with libraries and reading rooms supplied with the latest magazines and papers, and also bowling alleys, billiard tables, and rooms for entertainments and dances. There are tennis courts and baseball grounds where the smelter employees sometimes play a game with a team from the mines. However, the air is so thin that baseball is indulged in only moderately, and tennis, for newcomers at least, is always played in doubles.

The foreign colony publishes a creditable monthly magazine, the *Inca Chronicle*, which has the distinction of being printed nearer Heaven than any other periodical on earth. There is a hospital here, with expert physicians and trained nurses, and when the men are sick they are well cared for or are sent "down the hill." The terms "down the hill" and "up the hill" are used here in referring to the journey to or from the sea-coast.

Most of the Americans and other foreigners—men, women, and children—seem in good health. There are,

CERRO DE PASCO

however, some who cannot stand the thinness of the air at this altitude, and many are afflicted with pneumonia and have to be sent back post haste on special trains. I know of employees who have come up three or four different times, and, going down sick each time, have at last had to give up and return to the States. On the other hand, I have just been told of one Englishman who had lived at this high altitude continuously for twenty-three years. At the end of that time he won a lottery prize of five thousand dollars, took a long leave of absence, and went down to Lima intending to live in grand style as long as his funds lasted. He had been so many years in a rarefied atmosphere, however, that he could not stand the low altitude of the capital, and was obliged to return to Cerro de Pasco before he had time to get well started on spending his money.

The *soroche*, or mountain sickness, seems to attack everyone here when he first reaches an altitude of two miles or more above the sea. Every foreigner I have met has been more or less afflicted with it, although with some it merely means a slight difficulty in breathing. As a rule, most people recover from it quickly, although it returns at any over-exertion or imprudence. The first symptoms of the illness are nausea and pains in the head. Then comes vertigo and dimness of sight and hearing. Fainting fits may follow, and the blood may flow from one's eyes, nose, and lips. Those who have weak lungs are liable to have hemorrhages, and people with weak hearts become unconscious. *Soroche* sometimes even causes death.

I had an attack of *soroche* during my first trip to South America. As I came here yesterday over the Central Railway, I could feel the air growing rarer. At ten

LANDS OF THE ANDES AND THE DESERT

thousand feet my breath was so short I could not whistle, and much of my dictation at fifteen thousand feet was done in a whisper. After we passed the two-mile level I found myself weighing each sentence to see whether it was worth the effort required to utter it. At the stations I walked very slowly, and when the train started unexpectedly at Casapalca and I had to run to get on, I panted for five minutes before I recovered. The blood pounded in my ears and the top of my head felt as though it were being pried up with a crowbar.

In the cars behind me were men and women holding smelling bottles at their noses, and one Peruvian had a bottle at his nose and a gun in his bag. Before I came out of the train he told me he had two cures for the *soroche*. "One is this smelling bottle," he said, and asked me to try it.

"But will it do the business?" said I.

"I don't know," he replied, "but if not, I have a sure cure here," and he opened his bag and showed me the revolver.

The *soroche* attacks different individuals in different ways. My secretary had a slight touch of it, but this soon passed off and he thought he was proof against further trouble. He walked six miles that day, and then spent an hour in the bowling alleys at the club. At the same time he ate with his usual zest, and the result is that he has now a well-developed case of *soroche*. He is the colour of cheese, he cannot take three steps without resting, and he "loathes all manner of meat." A man who came up on the train with me says that his head began to ache during the night and his pulse jumped to one hundred and twenty. A young mining engineer who came last week to the Morococha copper property was met at the depot



Cerro de Pasco was an important mining town when Manhattan Island was mostly wilderness, but to-day it lives on the payroll of a great American corporation housed in a skyscraper of lower New York.



Some of the smaller mines of Cerro de Pasco are still worked by Indians. These are mere holes in the ground, unequipped with machinery, out of which men and boys carry the ore in sacks on their backs.

CERRO DE PASCO

with horses and rode at a gallop to the mines. This brought on such a severe attack that he was obliged to go back to Lima and spend a while on the coast. When he comes up again he will stop at Matucana, which has an altitude of eight thousand feet, and then make the remainder of the journey by easy stages.

I have talked with the doctors here as to the cause of *soroche*. They say it comes from the thinness of the air. One's system is accustomed to a certain percentage of oxygen with each breath he takes. You breathe at the same rate here as at the coast, but you get less oxygen, and as a result your blood becomes impure and there is a loading up of waste matter throughout the body, causing auto-intoxication, and if it continues long enough you have *soroche*.

The atmospheric pressure here is much less than at the seacoast. At Lima it is about fifteen pounds to the square inch, and here it is less than nine pounds. Consequently, it takes six minutes to soft-boil an egg, and you may boil beans all day and not have them cooked through, for in this atmosphere water passes off into vapour at a lower temperature than it does near sea level.

Many of the wiseacres, when they first come to the mountains, disregard what the doctors say. They do not take the ordinary precautions, and the result is usually a serious case of *soroche*, or even pneumonia. The other day a visiting physician was told he must not go out without his coat. He replied that his business was medicine and he knew how to take care of himself. He then straightway trotted about in the rain. He was stricken down with pneumonia, and within four days he was on his way back to the coast in a coffin.

CHAPTER XIII

AMERICAN INDUSTRY IN THE HEART OF PERU

THE story of the mines of Cerro de Pasco began about three centuries ago. In the year 1630 an Indian shepherd who had strayed far from his hut with his llamas and sheep was obliged to camp out overnight. When he awoke the next morning he found the rocks under the ashes of his campfire specked with globules of silver that had been melted by the heat. That discovery led to the opening of mines by the Spaniards, who drove the Indian peons into the workings and flogged them when the output lagged behind. Later the mines passed into the possession of *cholos*. At one time, when the price of silver was at its highest, the deposits were exploited by capitalists who paid the miners something like forty cents a day for twelve hours' work, with an ounce of coca leaves as an added inducement to keep them on the job.

Although the Cerro de Pasco mines produced an average of a million and a half ounces of silver a year from the time of their discovery until 1900, their greatest value to-day is in their copper. As the workings grew deeper, the ore yielded more and more of that metal and less of silver. Near the surface it often assayed one hundred ounces of silver to the ton, but at the depth of the present operations the silver content is less than ten ounces. Nevertheless, Cerro de Pasco is still one of the two most

AMERICAN INDUSTRY IN PERU

important silver districts of Peru, and Peru ranks third among the silver-producing countries of the world. Only the United States and Mexico surpass it.

Although the most valuable deposits here are owned by the Cerro de Pasco Copper Corporation, small holdings are still worked by the Indians for both silver and copper. The natives dig out the best ore with picks and bring it to the surface on their backs, in rawhide sacks, one man carrying from sixty to eighty pounds at a time. Some of it is brought up on ladders from a depth of two hundred feet or more.

The ground under Cerro de Pasco is honeycombed with the diggings out of which the ore has been taken for generations. Here and there on the surface are piles of ore, and everywhere are holes leading down into the native mines. Some of them are so close to the houses that I wonder that the babies toddling about do not fall in. In places the ground has sunk, and as I rode through the town I saw great pits, large enough to swallow the Vatican at Rome or our National Capitol at Washington. If the houses were built of heavier materials it is probable that the whole town would drop down into the excavations beneath it.

It was the great copper value of the ore that first attracted the attention of American capitalists to Cerro de Pasco about a generation ago. A syndicate including such men as J. B. Haggin, Henry C. Frick, the Vanderbilts, the Hearst estate, and others, was formed to buy the most valuable mines. No expense was spared in developing the properties, the company spending tens of millions of dollars to put them on a paying basis. This was accomplished in a few years, and their total mineral pro-

LANDS OF THE ANDES AND THE DESERT

duction now reaches an annual value of more than forty million dollars.

The extent of the present operations of the Cerro de Pasco Copper Corporation is almost inconceivable. Here on the top of the Andes the company has built up one of the greatest copper mining and smelting industries in the world. I have already described its railway from Oroya to Cerro de Pasco. It has also built a railway that runs about twenty-five miles north of Cerro de Pasco to the coal mines that supply the fuel for smelting the ore. At Oroya it has a twenty-thousand-horse-power hydro-electric plant that furnishes the power for its various properties, and a new smelter that surpasses any on the South American continent. At La Fundición, the site of its old smelter, it operates enormous ovens for making the coke used in smelting, and it has its own quarries of limestone. It owns also several other copper mines at Morococha, which is reached by a branch line from the Peruvian Central.

The company employs from six to eight thousand Indians and *cholos* in the mines and the smelter. As a rule they make good workmen. They are divided into two eight-hour shifts, so arranged that the second stops at two o'clock in the morning, thus enabling all the men to sleep a part of the night.

The prosperity of Cerro de Pasco, and, indeed, of this whole mining region, is dependent largely upon American capital. The corporation spends thousands of dollars a month in wages. The ores shipped to Callao and the supplies for the mines furnish the bulk of the freight business of the Central Railway. The company has great warehouses that stock everything in the line of mining

AMERICAN INDUSTRY IN PERU

and smelting machinery, as well as all sorts of supplies for its employees. Near one of the shafts I saw a lumber yard stacked high with Oregon pine, and was told that it was cheaper to bring the timber over its long ocean trip and then carry it up the Andes by railroad than to get the eucalyptus that grows in eastern Peru not more than two hundred miles from the smelter, but far from any railway.

It is doubtful whether there is any other place in the world where the copper deposits are of such enormous extent as here at Cerro de Pasco.

"You might compare the formations to your hand," said one of the superintendents in describing them to me. "Let the palm represent the great central mass of copper and your fingers the veins that extend out from it. On one of the veins alone there is enough ore in sight to keep us busy for ten years or more, and it is my opinion that we have barely scratched the surface of the copper. In the United States we consider a mine a good one if it will yield one or two per cent. of copper to the ton. Here we throw the ore away if it does not assay two per cent. Our average is from eight to fourteen per cent. and we have taken out some rock that has yielded forty per cent. to the ton."

On my visit to the mines I dropped down to the four-hundred-foot level and then rode through the narrow tunnels on one of the electric trains that carry the ore to the shaft. There are five shafts going down into the earth, one of them eight hundred feet deep. Tests have been made showing that the copper extends even below that level. There are about forty miles of tunnels, most of them so small that I could hardly stand upright in

LANDS OF THE ANDES AND THE DESERT

them, while from the centre of the track I could easily reach the sides of the walls. Some of them are reënforced with timber, but nearly everywhere the excavating is so expertly done that the rock needs no additional support.

As we went from chamber to chamber, we stopped at times to watch the miners operating compressed air drills and taking out the ore blasted loose from the rock walls. Everywhere I was impressed by the efficient methods employed, and I was particularly interested in the way the value of ore specimens was determined without a chemical assay. This is done by holding the ore to the flame of an ordinary tallow candle. The copper gives a green colour to the flame, by the intensity of which the experts can tell just about the percentage of metal the ore contains. The assistant manager made such a test for me, which showed that the sample averaged about twelve per cent. copper. In addition, the ore contains enough silver and gold practically to pay the cost of mining, making the value of the copper almost clear profit.

Until a few years ago the ore was sent to the smelter at La Fundición, not far from Cerro de Pasco. Before the erection of that plant, no smelter had ever been built at more than fourteen thousand feet above the sea, and at first the experts said that furnaces could not be operated at that altitude. They claimed that the thinness of the air would make it almost impossible to get the amount of oxygen needed for the blasts. Nevertheless, the syndicate determined to try the experiment. The furnaces were installed by the best engineers obtainable, but still they would not work, and one mining expert after another came here, threw up his hands in despair, and left. For a time it looked as though this great mining venture,

AMERICAN INDUSTRY IN PERU

which had already cost millions of dollars, would fail. At last came an engineer from Mexico, who experimented with the blasts until he finally was able to get satisfactory results. The gigantic smelter was then completed and successfully operated until it was abandoned in 1922.

In the meantime, a new and much larger smelter had been built at Oroya at a cost of fifteen million dollars. The altitude of that town is two thousand feet lower than that of La Fundición, and the heavier atmosphere makes it possible to operate the blast furnaces and converters with less difficulty. The Oroya smelter also has the advantage of being nearer to the company's Morococha mines and to Callao, the chief port of the country.

The white employees of the smelter live in the company's model village of Chulic, which has been built far enough away to be free from the sulphur fumes. As in Cerro de Pasco, there are modern club houses for single men, and a hospital in charge of American physicians and nurses. The guest house, or hotel, is unique in this part of the world. It has an up-to-date garage, an attractive patio, a glass-covered pergola, and modern bathrooms. Even the servants' quarters are equipped with showers, and though the Quichuas as a race are notoriously lax in the matter of personal cleanliness, the ones employed here find themselves looking for new jobs if they do not make frequent use of their bathing facilities. Homes of adobe or brick are furnished to the Indian employees, a low rent being charged chiefly to keep the natives from thinking the houses belong to them.

I wish I could take you through this great monument of American industry and show you the stream of ore that comes in over the railway and is fed to the fiery furnaces

LANDS OF THE ANDES AND THE DESERT

kept working by flames seven times hotter than those through which walked Shadrach, Meshach, and Abednego. Later you would see the liquid copper from the converters change in colour as it cools, and then watch the great metal "slubs" of three hundred pounds each loaded on the cars to be shipped to the United States. The smelter has a total capacity of eight million pounds of blister copper a month, and a yearly output of more than seventy million pounds. That amount when refined yields in addition to its copper content a half million pounds of silver and a small amount of gold.

Gold is found also in Peru on the eastern slope of the Andes, where extensive quartz mines owned by the Inca Mining Company have produced more than seven million dollars' worth. The mines are situated on the Madre de Dios River, not far from the head-waters of the Amazon, and about five hundred and fifty miles east of the Pacific Ocean. To reach them one has to take the Southern Railway at Mollendo and climb the Andes to Tirapata. From that station the miners follow a wagon road and mule trail across country for a distance of one hundred and forty-two miles. The road was built by the mining company over a mountain pass sixteen hundred feet high and through gorges six hundred feet deep. The mule trail that ends the route winds its way for thirty-eight miles up and down and along the sides of the cliffs. In return for building the road, the company received a concession of something like a million acres of land.

Another great mining development in the Andes far from any railway is that at Huancavelica, which is reached by a precipitous and winding mule trail from the terminus at Huancayo. There mercury mines were operated by the



The operations of the Cerro de Paseo Copper Corporation are not confined to mining and smelting ore, but include also developing water-power, running railroads, digging coal, making coke, and taking out limestone from its own quarries.



The ancient patio process of treating ore is still in use to some extent. By this method, masses of ore are wetted down with water, and then trodden by horses or mules driven round and round in the circular pits, or patios.

AMERICAN INDUSTRY IN PERU

Incas and later by the Spaniards. The old tunnels are now being cleaned out and re-worked, and new workings have been begun at still lower levels.

Not far from La Fundición are great deposits of vanadium owned also by an American corporation. One of the most valuable mines formerly belonged to an Italian, who later invested his wealth in vast haciendas and fine breeds of stock. Peru now furnishes seventy per cent. of the world's supply of vanadium.

CHAPTER XIV

BY ROLLER COASTER DOWN THE ANDES

TO-DAY I am again near sea level, and thankful to be safely down from the land of the skies. Yesterday I was on the roof of South America; now I am back at Lima, only a step from the ocean. The return trip furnished enough thrills to last me a life-time, and it seems almost a miracle that I am here to describe it.

Imagine, if you can, coasting down the side of the Andes on the steepest railroad in the world. Think of being now blinded in a blizzard and now pelted with hailstones driven into your face with the force of a gale. Sometimes the storm was so thick I could not see a stone's throw ahead; again, we were coasting along under blue skies and bright sunshine. One moment we hung to the edge of a precipice; the next we were flying over spider-web bridges of steel that spanned frightful chasms. We whirled about curves in the midnight blackness of mountain tunnels and burst again into the light of day only to shudder at the vast depths below.

All this can give you but a faint idea of my descent from the glacial snows of the Peruvian peaks, three miles high in the air. It was a journey filled with dangers that were terrifyingly real, and before I started, where the conditions seemed ideal, I was required to sign a paper swearing that my heirs would claim no damages in case I was

BY ROLLER COASTER DOWN THE ANDES

killed. An hour later it seemed to me that the railroad authorities were more sensible to require such a protection than I was to travel in such fashion.

The trip was made on the gravity car of the general manager of the Central Railway of Peru. It was merely a low platform mounted on wheels about two feet high. It had no motive power, and was controlled only by two brakes, one on each side at the front. On the platform was a seat wide enough for three persons, and as we took our places I sat in the middle, with my stenographer at my left and one of the officials of the operating department of the railway at my right. The brakes were manned by a *cholo*. We had to run upon schedule time, for we were on a single-track road and would have to pass both east- and west-bound trains on the way. We were to get our orders from the telegraph operators at the principal stations.

We started at Ticlio, amid the glaciers at the very top of the pass, and we could see clearly the great masses of ice on the mountain-sides. Just above us was Mount Meiggs, and all around were mighty peaks. The sun was shining, there were no clouds, and I was told that we should have no trouble in controlling the car, as the only danger comes from rain or snow, which makes it difficult for the wheels to hold to the rails.

We let go the brakes and fairly shot down the track. We had hardly left Ticlio, however, before the sky changed and the winds began to blow up the gorges. The air grew cold, and within five minutes we were in the midst of a snowstorm. A moment later the snow turned to hail. The stones were as big as peas, and they bounced like rubber as they fell. With the hail came thunder and

LANDS OF THE ANDES AND THE DESERT

flashes of lightning. In the rare air our ears fairly cracked with the sound, and the lightning made more visible the dangers about us.

As we went on, the rails became white and the rocks were hidden in snow. Our car was soon half full of hail, and the tracks became more and more slippery. Then the wind increased to a gale, and my stenographer, who was taking his notes on wet paper, notwithstanding the storm, cried out that his hat had blown off. Very foolishly, we stopped the car and sent the *cholo* brakeman back up the track. At this time we were only ten minutes ahead of a train that was following us. We waited five minutes, but the *cholo* did not return. Then my secretary went back and recovered his hat about two hundred yards from the car on the edge of a four-hundred-foot cliff. The *cholo* had disappeared. We waited for him two minutes longer, and then, hearing the whistle of the down-coming train, we knew we should have to go on and manage the car ourselves. My companions manned the brakes on either side, and we began again to coast down through the storm. I learned afterward that no trace was ever found of the brakeman, and that he must have fallen over the cliff in the blinding snowstorm.

The cold was piercing. The wind went through our clothing and the great hailstones cut our faces. At times, when the clouds were the blackest, we could see only a few feet ahead, but could look down the sides of the cliff to which the track clings and see the snow-clad walls far below us. Now we would be flying into tunnels, which were the safest places, for there the rails were dry and the wheels did not slip when the brakes were put on. Indeed, we almost prayed for the tunnels, and were glad

BY ROLLER COASTER DOWN THE ANDES

when we dashed out of the blinding sleet into the darkness.

Suddenly we saw ahead two trains standing on a siding at one of the switchbacks. They were waiting for us, and the engineers said another train coming up must pass before we could go on. By that time we were chilled to the bone, and our faces were blue with the sleet and the cold. We climbed out of our car and into the cab of one of the oil-burning engines. The heat of the boiler soon thawed us out, and within a short time dried our clothes, which had been wet by the snow.

We were still in the storm when we left the switchback. The rails were covered with sleet and we could not be sure of the track. At one place we passed a gang of labourers working on the road-bed, and at another time narrowly missed a drove of llamas crossing the track. As they saw us rushing toward them, the animals began to run, leaping along in kangaroo jumps, with their Indian drivers trotting behind. At every hamlet along the way the dogs ran out and barked at the car and snapped at us as we flew by. The danger was that a dog might get in front of the car and throw it off the track and down the sides of the mountain. When it rains in the Andes, masses of earth and rock fall down upon the track, but we were going too fast, and the storm was too thick, to try to watch for slides.

By and by we passed Casapalca, where we dropped down out of the storm. The sun came out again, the sky was blue, and we could see for miles. The track dried, and we coasted along at great speed through some of the most wonderful scenery on earth. Now we rode for miles between walls of rock that extended upward for thousands of feet, and now hung over gorges at the bottom of which,

LANDS OF THE ANDES AND THE DESERT

a thousand feet below, rushed the foaming Rimac. Now we entered a tunnel high up on the side of a cliff, and, looking down, saw another tunnel almost directly below us. We rushed out of one tunnel into the *Infernillo*, where a slender bridge of iron joins two great walls of rock. Above us through the narrow slit of the cañon was the blue sky of Heaven, and below was the gorge that these people call the Little Hell. The bridge there spans a chasm two thousand feet deep, and we trembled at the thought that there might be a train in the tunnel beyond.

The whole of this wonderful railroad seems blasted out of the sides of the mountains. Here it hangs to the cliffs, there it bores through the rocks, and again it zigzags back and forth in great loops. Some of the tunnels are so close together that they made me think of the road between Monte Carlo and Nice, a trip on which has been described as "riding through a flute and looking out of the holes."

I wish I could show you the formations of the Andes. They surpass in some of their wonders the Alps and the Rockies, and I have seen nothing like them in the Himalayas. We have a little patch of four hundred acres in Colorado in the foot-hills of the Rockies that we call the Garden of the Gods. Not far from Cerro de Pasco, in the heart of the Andes near the railway from Oroya, is a similar garden with hundreds of weird formations for every one in Colorado. It lies at an altitude five hundred feet higher than the top of Pike's Peak, and is looked down upon by mountain peaks from seventeen to twenty thousand feet high. It is twenty miles long, and between three and five miles wide, and its area is completely covered with natural arches, walls, temples, and rocks of all shapes and sizes.

BY ROLLER COASTER DOWN THE ANDES

One of these rocks, called the King, is a gigantic figure as tall as a house. Its head is poised upon a neck not more than three feet in diameter but so long that it towers high above all its surroundings. Another rock is known as the Turtle; it is a gigantic block shaped like a tortoise, and the natives believe that it upholds the world. A third looks like a great steamboat perched on a pedestal, and a fourth is a mighty tower. In this same region is the Rock Forest, consisting of hundreds of acres of columns standing out on the plain. At a distance they look like a great wood that has been burned over.

And then there are castles, palaces, and fortifications. With a little imagination you can find almost any kind of architecture, or the model of any great structure. In South Africa I have seen Table Rock, which hangs over the harbour at Cape Town. There are table rocks of marble here in the Andes that look as though they had been cut by a sculptor. There are formations like those of the Giant's Causeway in Ireland, although they are not of hexagonal shape, and in riding through the mountains I have seen castles of the purest white marble, which in their grandeur excel the ruins of those mighty works of man on the Rhine.

These mountains have all the colours of the Grand Cañon of the Colorado. Now the rocks are blazing white, and now they remind one of the rusted marbles of the Parthenon at Athens. Here they are brown, farther on they are blue, red, or drab. Drab is the predominant colour near the sea, where much of the formation is limestone. Now the mountains are ragged and rough, and rise in ruined cities. I saw some the colour of old red sandstone that made me think of the fortifications

LANDS OF THE ANDES AND THE DESERT

at Delhi in India. I saw others that were spired like the cathedrals of Cologne and Milan. These spires are as white as Carrara marble, and they glisten like snow under the sun. Other rocks are dome-shaped, and still others extend in great waves, showing the folds in the earth and forming curving walls of wonderful beauty.



At El Infernillo, "the Little Hell," the railroad dives into a tunnel bored through the towering rock, emerges upon a bridge spanning a chasm two thousand feet deep, and then plunges into another black hole in the mountain side.



The famous Garden of the Gods of Colorado is but a dooryard filled with pebbles compared with the vast and weird formations of the Rock Forest of the Andes.

CHAPTER XV

AREQUIPA, CITY OF THE STARS

I HAVE now come to Arequipa, the metropolis of southern Peru. It is situated one hundred miles inland from Mollendo, which ranks next to Callao as a commercial port. Nevertheless, it has such a poor harbour that ships have to anchor far out from the shore, and the swell is worse than that at Jaffa, which tossed Jonah's ship so that the sailors threw him out to the whale. The Mollendo harbour is partially protected by a small breakwater, but the ocean is often so rough that passengers have to be lifted by steam cranes out of the small boats that bring them to the dock from the steamer, and goods have to be put on and off the boats in the same way. The sea was tamer than usual when I came into port, but my boat rose and fell eight or ten feet with each wave, and I had to make a flying leap from one of the seats to the steps that led to the custom house. There has been some talk of transferring the port for Arequipa from Mollendo to Matarani, eight miles to the north, which has a good harbour. Such a move would also shorten the railway route over the mountains.

I wish I could take you over the route of the journey I made up the Andes from Mollendo to Arequipa. The country is even more dreary and wild than that above Lima. I rode for miles without seeing a blade of grass or anything green. I saw shifting sand dunes and bluffs

LANDS OF THE ANDES AND THE DESERT

that had been ground so smooth by the wind-blown sand that the strata could be plainly seen. Farther on the sand had cut into the rock of the mountains, making furrows in it like the wrinkles on an old woman's face. In many places the rocks have been ground to a powder. These slopes get no rain whatever, and water for the stations along the way, as well as for Mollendo, is piped from Arequipa.

As we went on, it seemed as though the skin of vegetation and life had been peeled from the earth, and that we could see the great ball as it was before plant or animal life had sprung into being. All around us was nothing but rock, and there was not a bit of soil in sight. At the same time, the scenery was magnificent, and the air was so clear I could see for miles. The clouds painted spots of purple velvet on the hills all through the afternoon, and toward evening the sun tinted the mountains with delicate shades of blue, pink, lavender, and mauve, until they looked like a mighty picture sketched by the hands of the gods on the canvas of the sky. As we started out, we could see the spray dashing high up on the beach, and at the close of our journey the moon was just rising over the snow of the mountains above old Arequipa. The trip made a panorama such as I have seen nowhere else, and such as I venture can be seen in no other place.

Arequipa is built in an oasis made by the Chile River in the arid Andes of this Pacific coast desert. It is walled in by ragged dry mountains but bedded in a valley of perpetual green. A legend regarding its origin relates that a party of Quichua Indians under an Inca leader came upon this beautiful little oasis after a long march through the bare and dusty mountain slopes of the surrounding

AREQUIPA, CITY OF THE STARS

desert. Upon their asking the Inca to be allowed to stay on that fertile and peaceful spot, he replied, "*Ari, que-pai*," which in the Quichua language means, "Yes, remain."

Arequipa is about seventy-six hundred feet above the sea or a mile and a half higher than Philadelphia. Some of the mountains about it are four miles in height. Just behind it is the great volcano, Mount Misti, which has a crater a half mile in diameter. To the left of Misti is Chachani, more than twenty thousand feet high, and beyond are Pichu-Pichu and other Andean giants.

Indeed, there is no city anywhere in South America more beautifully located, and you will go far before you will find one that is so fresh, so bright, and so quaint. The houses of Arequipa look as though they had just come fresh from a toy-shop of the giants. I bought my postage stamps to-day in a building the colour of old rose. I ate my breakfast in a restaurant painted sky blue, and next door was a house the colour of strawberry ice cream. This morning I visited the new market of Arequipa; its walls are built of pink and white stone. The surrounding buildings are of similar bright colours, and the whole seems to fit in with the air of southern Peru.

But come with me into the market. This will show us why the city of Arequipa has been built where it is. The merchandise you see comes from the valley of the Chile River, which contains about fifty square miles of cultivated land. This oasis valley produces grain, alfalfa, and fruit, raises cattle and sheep, and makes Arequipa an important trading centre. As we go through the market we see everywhere evidences of the fertility of the soil and the wonderful climate. Nearly every fruit that

LANDS OF THE ANDES AND THE DESERT

can be raised in the United States is on sale here. There are apricots, peaches, apples, and plums, and strawberries as big as a walnut. There are oranges and lemons, bananas and figs, and bushels of alligator pears. There are green watermelons, some of which are as red inside as any that ever made a darky's mouth water, and others with flesh as yellow as gold, although the seeds are jet black. In the vegetable stalls we find fully as great a variety. It is now midwinter in the United States, but here below the Equator it is summer, and we see new potatoes and fresh green corn. There are bright red tomatoes, white cauliflowers, and great quantities of cabbages, as well as yuccas, sweet potatoes, and yams.

Arequipa is the chief wool market of Peru. The leading exporting houses of this city have their agents in all parts of the Andean plateau, where they buy vast quantities of vicuña, alpaca, and sheep's wool from the Indians and *hacendados*. The wool is sent overland to Lake Titicaca, and from there by rail to Arequipa. Some of it is consumed in the woollen mills of Peru, but the bulk of the product is sent to Europe and the United States. Besides being a market town, Arequipa makes harness and saddlery, boots and shoes, and it has large cotton, chocolate, and flour mills. The Southern Railway of Peru has its headquarters here, and also its shops, which employ about five hundred men in building passenger and freight cars, as well as making all the repairs on its rolling stock. This line is one of the three chief gateways to La Paz, the capital of Bolivia.

Travellers bound for La Paz and Cuzco often stop a day or so in Arequipa in order to make a more gradual ascent



Mollendo is the second port of Peru, but it has no harbour to speak of, and vessels must lie in the open roadstead. It is the coast terminus of the railroad to Arequipa, Cuzco, and Lake Titicaca.



"The country along the railroad from Mollendo is the dreariest and wildest imaginable. It never gets a drop of rain, and it looks as though the earth had been stripped of its skin of vegetation."



Lying in the valley of the Chile River, Arequipa serves a large agricultural district and is Peru's chief wool market. It is a stopping place for travellers who wish to make a gradual ascent to the higher altitudes of the Andes.

AREQUIPA, CITY OF THE STARS

from the coast to the rarefied atmosphere of the highlands, and as this travel has increased since the opening of the Panama Canal, there has been a marked improvement in the hotel accommodations. In addition to a fairly good hotel, there is a boarding house run by an American woman that is famous all over the west coast for its comfort and good food. Formerly the chief hotel was kept by an Italian who quartered his guests on one side of the plaza and fed them on the other side in a long, low *comedor*, or dining room.

When I visited Arequipa in 1898 it was lighted by kerosene, and I do not remember that it had a car line. It has now an electric light plant run by water-power, and also an excellent system of tramways that extend out into the country. It is well equipped with telephones, and long-distance messages can be sent at low rates.

I find Arequipa quite as interesting as Lima. It has a great cathedral of white stone that covers an acre or so of ground. It faces the plaza, occupying the whole of one side of the square. The other three sides are lined with stores as quaint as any I have ever seen in Europe. The buildings are of only one story, and in front of them extend wide *portales*, or corridors, with huge columns separating them from the plaza. On the other side of the corridors is a row of cave-like shops, lighted only from the front and the roof. The stores are fifteen or twenty feet wide and thirty or more feet deep, and with their arched ceilings they look like vaults. The goods, which include many articles made in the United States, are hung from the ceilings and piled up on the floors.

Nearly all the houses of Arequipa have vaulted roofs, which, on some of the one-story structures, extend up in

LANDS OF THE ANDES AND THE DESERT

oval domes or hoods. The city has had many serious earthquakes, and for this reason the skyscraper will never be known here. Even a five-story building would be the talk of the town.

Arequipa is one of the oldest cities in America, dating back almost to the days of Pizarro. It is a place of old families, and the centre of culture for southern Peru, as well as an ecclesiastical and political headquarters. There are a university and several colleges here, and also a school of arts and an agricultural institute. Moreover, this city boasts of having the best hospital in South America, although the climate is unusually healthful and the death rate is low.

I doubt whether you will find many places that have finer weather all the year around than Arequipa. The sky is almost always blue, and the days are sunny from morning to night. Indeed, the belief that this region has more clear weather than almost any other locality on earth was responsible for the establishment here of the Harvard University observatory. This is one of the most noted astronomical stations of the world. It is situated on the slope of Mount Misti, five hundred feet above Arequipa, where the observers can have an unobstructed view of the heavens.

The observatory is equipped with great telescopes, one of which has a lens two feet in diameter, enabling the scientists to take photographs on plates fourteen by seventeen inches in size. The tube of that giant instrument is so delicately balanced that a child could move it. The Harvard scientists have taken as many as fifty photographs in a night and thousands in a year. After being developed, the negatives are shipped to Cam-

AREQUIPA, CITY OF THE STARS

bridge, where there are now more than one hundred thousand of them available.

There is, I am told, nothing duplicated in the sky. Each half of the world has its own stars and constellations, and there are some here that we never see in the North. One of them is the famous Southern Cross, but it seems to me that its beauty has been greatly exaggerated. There are only four stars in it, and they are so small that one has to look hard to find them. It does not compare with the Big Dipper. Many of the other stars are far more brilliant than in the North. This is so of the Milky Way and of most of the planets. I have been on the Equator when the path of a planet on the still waters of the ocean was almost as well marked as the reflection of the moon; and in riding at night up the Amazon River the stars seemed so close that I felt as though I could almost reach out and grasp them.

The story of the establishment of this observatory is interesting. It was near the end of the nineteenth century when Uriah H. Borden died and left two hundred thousand dollars to Harvard University, with the stipulation that the money was to be used to build an observatory at the best place on earth for the study of the stars. The authorities tried Colorado and California, and then came to South America. Their first work was done back of Lima on what is now called Mount Harvard, but in 1891 they moved their station to Arequipa. The university astronomers have been working here ever since. In 1892 the scientists established a meteorological station on Mount Chachani at an elevation of 16,650 feet. This was moved the following year to the top of Mount Misti.

Mount Misti is 19,200 feet high, so that this weather

LANDS OF THE ANDES AND THE DESERT

station is the loftiest of its kind in the world. It is higher than any point in North America outside Alaska, and it is fully a mile above the observatory on the top of Pike's Peak. The site of the station is on the edge of the huge crater, which at times sends clouds of sulphurous yellow vapour a thousand feet into the air. At other times, I am told, the volcano spits out hot water and steam. The automatic instruments installed on the mountain will run several months without rewinding. They keep a continuous record of temperatures, rainfall, air pressure, humidity, the direction and velocity of the winds, and of other conditions of the atmosphere, and the scientists need only visit the station at intervals to note the results. The machines work with great regularity, but sometimes the mountain is so covered with snow and at other times swept by such gales that there is now and then an interruption in the records.

Although the station is only eleven miles in a straight line from the observatory, it is forty miles distant by way of the road built to the summit of the mountain. The trip up to it is made on muleback, travellers spending the night at a hut at the base of the peak. One of the first huts erected on the trail stood at an altitude of more than sixteen thousand feet. It was known as the "Inn of the Water of Miracles," because of an old legend that the Lord appeared here and caused water to flow from the ground. This spring, the Indians say, is the same one that is still bubbling away near the hut.

Professor Bailey, who established the station, had great difficulty in transporting his instruments to the mountain-top. A large number of mules and Indians was needed to carry the material. As they still do to-day, the Indians



Because it has such a high percentage of cloudless days and nights, Arequipa was chosen as the site of the Harvard Observatory. Above it, on Mount Misti, is the world's highest weather station.



Juliaca is a town on the roof of the continent, more than two miles high on the Peruvian plateau. The tops of the mountain ranges about it are three miles and more above sea level.

AREQUIPA, CITY OF THE STARS

then regarded Misti with superstition, and when they found an iron cross standing on the mountain-top they fell down and worshipped. This cross is said to have been set up in 1677 by a party of Spanish priests who had gone there to offer prayers to Misti that the city of Arequipa might be made free from earthquakes. The Spaniards found at the summit of the mountain the remains of stone structures that have now disappeared, and it is believed that the crater was the scene of sacrificial rites and ceremonies held by a people long before the time of the Incas.

CHAPTER XVI

FARMING IN THE LAND OF THE SKY

MY PRESENT destination is Cuzco, the ancient Inca capital, far up in the Andes. By fast trains it is possible to go all the way from Mollendo to Cuzco within three days, but I am taking several more for the journey in order that I may better see the country and the people. From Arequipa I crossed the pass of Crucero Alto, the highest on the route of the Southern Railway of Peru, and then dropped down to Juliaca, which has an altitude of less than thirteen thousand feet. Juliaca is the junction where the Southern Railway divides, one branch going southward to Puno on Lake Titicaca. The other branch, and the one I took, goes north over the great plateau to Cuzco. I am now at Sicuani, a little town only one hundred miles or so from Cuzco, and I shall go on to that famous city to-morrow. Sicuani is east of the western range of the Andes, and it was in a driving snowstorm that I slid over the mountains from the Pacific slope to the plateau. The journey from Arequipa to the top of the mountains is even more marvellous than the first part of the trip over the desert from Mollendo. I wound my way around Mount Misti, and higher still saw mountains covered with glaciers, some of them of enormous extent.

The greater part of the way was through a region of extinct volcanoes. The slope of Mount Misti is covered

FARMING IN THE LAND OF THE SKY

with great blocks of black lava, and the mountains that wall this high valley where I now am have Niagaras of lava that seem to have frozen as they flowed down the slopes from the craters above. In places I could look over walls of such rock a thousand feet high, and above them, on mountains that are more than four miles in height, could see glaciers. At times these mountains rise up like great white ramparts of irregular shape, and again they extend in a saw-tooth formation as far as the eye can reach.

Everywhere along the railroad are irrigated valleys. The streams are small, but even a little water makes the desert a garden. Along the course of the Chile River is a strip of green, and about Arequipa wheat, barley, corn, and all the vegetables and fruits of the tropic and temperate zones are raised.

The vegetation changes as one nears the top of the Andes. At an altitude of two miles or more grass begins to sprinkle the semi-arid hillsides, and as soon as we crossed the pass and came down to the plateau we were in a region of sod covered with tufts of wiry grass. The new sprouts of this grass are eaten by cattle, but most of it is so coarse that only the llamas will feed on it. The plateau is covered with tens of thousands of cattle and millions of sheep and alpacas. At every few miles are Indian villages, and in places the plain is dotted with low mud huts roofed with straw, each of which is the home of an Indian who grazes his alpacas and llamas close by. Near every hut is a small patch of potatoes, barley, or quinoa. Quinoa is a plant something like pigweed, from the seeds of which the Indians make a sort of mush.

The average altitude of this region is from twelve to thirteen thousand feet above the sea, and some places are

LANDS OF THE ANDES AND THE DESERT

more than fourteen thousand feet high. There are millions of acres of land in the plateau with a climate in which white men can live, and a land development scheme has been inaugurated by the Peruvian Corporation, the British company that operates many of the government railways. This company sent to the United States for an agricultural expert to determine what grasses and grains are best adapted for cultivation on the plateau. I met this man at Juliaca and went with him to some of the experimental farms. He showed me a field of four or five acres near the railroad planted to cereals and grasses of various kinds. One plot of barley consisted of perhaps fifty rows, each row grown from seed gathered from a different part of the world. Some came from Smyrna, some from Yugoslavia, some from Russia, and some from the western highlands of the United States. Other rows were from seed brought from Manchuria and the plateaus of India and Tibet. All of these barleys were doing well, and many of them looked better than the native Peruvian grain. There seems to be no doubt that almost any kind of hardy barley can be raised on the plateau, and that these experiments will greatly contribute to farm progress on the highlands of Peru.

The plateau was once part of the basin of Lake Titicaca, and its soil is rich and almost free from stones. There are millions of acres of it that have never been touched by the plough; indeed, it is doubtful whether any of it has ever been thoroughly cultivated. The Indians use ploughs made of wood that cut the ground to a depth of only three inches. They work bullocks as draft animals, and farm the same way that their ancestors did generations ago. Even so, they raise fairly good crops.

FARMING IN THE LAND OF THE SKY

The most common farm implement used by the Indians is a kind of foot plough called a *taclla* in the Quichua language. It consists of a wooden handle five or six feet long shod with an iron point. On the left side, as the Indian holds it, are two projections from the handle, one for his foot and one for his hand, to aid in forcing it into the earth. This primitive plough, though handled somewhat like a spade, is not used to turn over the ground but only to loosen it. Two men always work together side by side so that their *tacllas* lift up the same piece of sod. A boy or woman works along with them, kneeling on the ground and turning up the loosened earth. A similar implement is found still in use in parts of Scotland and in the Hebrides Islands.

We next went to the plots where experiments are being made with hardy grasses. There I saw American timothy and red clover sprouting through the brown soil. I saw patches of Russian grasses growing luxuriantly, and also wheat grasses from our western plains, as well as a member of one of the families of blue grass that thrive on the high plateau of the Rockies.

From the plateau the railroad drops down into the valley in which Cuzco is located. This valley is a series of little Gardens of Eden, and there are cultivated lands along both sides of the Vilcanota River. The fields are in terraces green with luxuriant crops, and the water is carried out over them so that it falls from level to level. In coming to Sicuani I saw many patches of barley, potatoes, and beans, and also hundreds of little fields of Indian corn. In the upper altitudes this crop reaches to the height of my knee, but where the lands are a little lower, and consequently warmer, it grows as high as my shoulder.

LANDS OF THE ANDES AND THE DESERT

I am told that in the valley near Cuzco, through which I shall go to-morrow, the crops are still more advanced, and that the barley, which is green in the highlands, is there almost ready for harvest. The irrigated land of the valley is exceedingly valuable and has all been taken up by whites or *cholos*, who are exploiting it with Indian labour.

The chief industry of the Peruvian plateau is stock-raising rather than farming. The climate at an altitude of twelve thousand feet is warm during the day, and even in the coldest of weather the thermometer does not drop below zero at night. Therefore the sheep and cattle can feed out-of-doors all the year round. When snow falls the hot sun melts it in an hour or so. About the most dangerous features of the weather are thunderstorms, with their accompanying lightning, which often kills people and sheep. The plateau has two seasons, dry and wet. The wet season begins in September or October and lasts until April or May. During that time it is usually clear in the morning, with rain or snow in the afternoon. The dry season, which is from May to September, is delightfully clear. The sky is always blue, and the tropical sun makes the weather much like Indian summer in the Virginia mountains, which I believe is the very best weather on earth.

On my trip over the Central Railway to Cerro de Pasco I passed flock after flock of fat sheep with tails as big around as my arm. To my eyes, there seemed to be nothing for them to eat, but they manage to live and grow fat on the moss and the thin, fuzzy grass. Some of the large flocks are owned by rich capitalists. There is one firm near Cerro de Pasco that has sixty thousand or more.

FARMING IN THE LAND OF THE SKY

There are also hundreds of squatters, Indians or *cholos*, each of whom raises a few sheep every year. I saw watching over the flocks boys and girls of ten or twelve years of age, who knitted or spun as they cared for the sheep.

Some of the great haciendas of the high Andes yield large incomes. There is one near La Fundación that produces tens of thousands of pounds of wool every year. It belongs to a company in Lima and is managed by a Scotchman who employs only Scotch shepherds. This ranch has thirty-six thousand sheep, which are kept in fenced fields. The manager is making many experiments in introducing new blood into the flocks, and he is also crossing Scotch collie dogs with the native dogs of Peru to produce a breed especially suited to conditions on the high Andes.

An Italian in this section is experimenting in bringing in fancy breeds of cattle. He has a number of large haciendas, and expects to supply the meat market of the coast. This same man owns thousands of llamas and donkeys and is said to have almost a monopoly on the freight business about Cerro de Pasco.

I never tire of watching the llamas. They crowd the streets of the villages, droves of them line the plazas of every city and town, and I have often met long caravans of them being driven across the plain. They are, in fact, competing with the railroads as the common carriers of the Andes. They transport grain, vegetables, hides, alcohol, coca leaves, and goods of every description. Many of them are used to convey the ore from the mines to the smelters, and the farmers use them to take their produce to the towns and railroads.

LANDS OF THE ANDES AND THE DESERT

The llamas carry their burdens tied on their backs like a saddle, and not in the panniers used with donkeys. There is a tradition that a llama will carry just one hundred pounds and that if one ounce more is added he will lie down and no whipping or beating can make him go on. This statement is ridiculous. The llama, if overburdened, will surely lie down and refuse to move, but that he has the intelligence to know when the hundred-pound load is reached is one of the fictions of the modern Munchausens. Indeed, there are very few llamas that can carry as much as a hundred pounds, although there are some of the beasts that will carry one hundred and twenty. The average load is about seventy-five or eighty pounds.

The llamas are of different sizes, according to their ages and the care they have received. When full-grown their heads reach a height of six feet or more; but their long, straight necks make them look taller. They have long ears that stand up like those of a fox terrier. They have full, round bodies, like that of a sheep, and comparatively long legs. They look like miniature camels, and like the camel, they can go for several days without food or water. Many of the farms are remote from the towns or the railroads, and a llama has often to make a journey of four or five days or a week in carrying his load to its destination and bringing another back. During this time I am told that he eats practically nothing, and gets along without water. The wool of the llama, as I have said, is coarse and has no value in commerce, although it is used by the Indians for spinning thread and making rough cloth. The meat also is too coarse for the markets.

The alpacas are much smaller than the llamas, and do not look so much like camels, having shorter necks. They



Llamas are competitors of the railroads as common carriers of the Andes. They are sure-footed beasts, adapted to the mountain trails, and, like camels, can make long trips on but little food and water.



In contrast to the bleak lava-coated mountains, the little green valleys between seem like miniature Edens. The Indians irrigate their terraced farms with water from the river, and get excellent results in crops.

FARMING IN THE LAND OF THE SKY

are more delicate and are not used as beasts of burden, although there are crosses between the alpaca and the llama that serve as freight carriers. They are usually to be seen in the llama trains and are often of a brownish yellow colour. The alpacas one sees on the pastures—and there are millions of them on the high Andes—are white, black, or brown, and sometimes spotted. They do not thrive anywhere below a mile above the sea, and they are usually found at a height of two miles or more. The grass they are accustomed to eat on the high plateau is short and fine, and they eat it down so close to the ground that the sand keeps their teeth worn down. In the luxuriant grass of the lowlands their teeth often grow so long that they cannot graze.

The wool of the alpaca is very fine and often more than eight inches long; it brings about twice as much a pound as sheep's wool. Usually the animals are clipped every two years, when the average fleece should weigh five pounds. In some years nearly four million pounds of alpaca wool is shipped to England for manufacture. Three fourths of the entire supply of the world comes from Peru.

I have seen some vicuñas during my travels through the Andes. They are the wild half-sisters and half-brothers of the llamas and alpacas, and are smaller than either. They cannot be domesticated, but they will sometimes come down from the mountains and mix with the flocks of llamas, alpacas, and sheep on the plains. They are often shot by the Indians and *cholos*, although this is against the law.

The vicuña wool is finer than that of the alpaca, and it brings a high price. There is so little of it, however, that it is hardly worth mentioning, much of the so-called

LANDS OF THE ANDES AND THE DESERT

vicuña cloth being really made of alpaca wool. The yellow, woolly fur of the vicuña is as soft as a sealskin coat, and for this reason the pelts are used to make the rugs so highly prized by tourists. These rugs vary in value according to the part of the animal from which they come. A rug made from the necks or legs is much more valuable than one from pieces taken from the rest of the body. During a previous visit to South America I bought a beautiful vicuña rug in La Paz for about twenty dollars in gold. I am told that similar ones now cost fifty dollars and more.

The vicuña has been crossed with the alpaca, producing the animal known as the "paco-vicuña," which can be domesticated. Its wool is especially valuable, combining the length of alpaca wool with the silkiness of the vicuña.

CHAPTER XVII

THE ANCIENT CAPITAL OF THE INCAS

COME with me this morning for a stroll through Cuzco, the ancient capital of the Incas, that wonderful people who ruled most of western South America until about four hundred years ago. Like the reigning dynasties of old Japan and Egypt, they believed themselves to be descended from the gods, and they called themselves the children of the sun.

One tradition tells that the Incas sprang into existence on one of the islands of Lake Titicaca. A prince and princess of the race, Manco Ccapac and his wife, who was also his sister, were given a golden rod by the sun god and directed to go forth and civilize the savages who then inhabited the high plateau of the Andes. They were told to build a city wherever that rod should sink into the earth. They travelled across the plateau over much the same route by which I came on the railroad, and when they reached this spot the golden rod fell and disappeared into the ground.

They established their capital on the site of Cuzco, on the slope of the mountain overlooking a beautiful and fertile valley in the heart of the Andes. That was hundreds of years before Columbus discovered America, and the empire then founded was from four to six centuries old when it was destroyed by the Spaniards.

The Incas first cultivated the valley of Cuzco, and

LANDS OF THE ANDES AND THE DESERT

then gradually conquered the neighbouring regions until their dominions extended northward far beyond Quito and south of where the capital of Chile now stands. They had subjects all along the eastern slopes of the Andes, and the western limit of their rule was the mighty Pacific. They governed a country as long as the distance between the Arctic Ocean and the shores of Lake Erie and larger than all the United States east of the Mississippi Valley. Their subjects were numbered by the tens of millions.

The Incas built a road through their territory from Lake Titicaca to Quito, the remains of which can still be found. As there were no wheeled vehicles at that time, the highway was in many places not wide enough for the cart or automobile of to-day, but it was nevertheless a difficult piece of construction. In places it went up and down steps cut into the steep mountain slopes, in others it wound around obstacles, and many times it narrowed to a mere path in which the Indians had to walk single file.

At the time they were overthrown by the Spaniards, the Incas had divided the country into provinces, ruled by viceroys and subordinate officials. They had not only subdued the savages, but civilized them as well, making them into farmers, mechanics, and artisans. In their religion they recognized the sun as the lord of the world, and their emperor as his representative on earth. One of their prayers was somewhat as follows:

O conquering and ever-present Creator, Thou who gavest life and strength to mankind, saying let this be a man, and let this be a woman; Thou who vouchsafest that man shall live in health and peace; Thou who dwelleth in the heights, in the storm clouds, and in the thunder; hear us and have us in Thy keeping. Thou who art without equal unto the ends of the earth, grant us eternal life and keep us free from danger.



Built by an even earlier race than the Incas, the great Sacsahuaman fortress was one of the last places defended against the invading Spaniards. The latter used the walls as a source of building stone.



"So skilfully did the Incas fit together the huge blocks of stone, without the use of mortar or cement, that I could not thrust my knife blade in the cracks between. Some of the stones weigh eight hundred tons."

THE ANCIENT CAPITAL OF THE INCAS

The Incas built temples to the sun, some of which were plated with gold, and within which were images of the sun god made of pure gold. The people believed in this religion and were pious and peaceful. They gave a part of their time to work for their god, and a part for the sick and the widows and orphans. They worked also for the government, and, last of all, for themselves and their families.

The Incas irrigated the deserts, and the remains of their aqueducts, built of stone slabs neatly fitted together, can be seen to-day. Millions of acres were watered by these works, which included one aqueduct that was five hundred miles long. Their irrigating canals ran along the sides of the mountains and also were cut through them in tunnels. As I rode to Cuzco along the high plateau, I saw thousands of acres of terraces, now gone to ruin and almost a desert, that these people once made to blossom like the rose. Such terraces are found on the sides of the mountains above almost every valley of the Peruvian plateau and along the west coast. They extended up the slopes like so many steps, the earth being held back with stone walls.

The Incas at that time were by far the most civilized people of all South America, and they are believed by some to have been more advanced than the Aztecs of Mexico. They knew how to mine and work gold and silver, and were skilful in the refining of copper and lead. I have seen some of the tools they used in erecting their buildings. They knew how to temper an alloy of copper and tin in such a way that the tools made of it had an edge like a razor and could cut the hardest of stone. They tamed the wild llamas and alpacas of the pampas. They made the llamas their beasts of burden, and from the

LANDS OF THE ANDES AND THE DESERT

wool of the alpaca and the vicuña they wove garments and blankets. They were a nation of potters and shaped beautiful vessels out of clay. They made also hats and shoes and were skilled in the dyeing of fabrics.

Here at Cuzco and in other parts of Peru I have seen animal figures made by the Incas. They are known as the "Small Stone Llamas of Cuzco," and are pieces of stone shaped like llamas, with a hole in each one the size of a thimble. They were used as sacrifices to Pachamama (the Earth), as a payment for the pasture eaten by the flocks. The holes were filled with wine or alcohol, and the images buried in the ground where the sheep and llamas grazed. A new figure was buried each year, the old one being dug up and reinterred at a greater depth.

These Incas, whose ancestors date back almost to the time of Christ, knew something of astronomy. They observed the equinoxes and the eclipses of the moon and the sun. They had a system of arithmetic and made calculations by means of knots on strings of different colours. They had musical instruments like some that their descendants play upon to-day, and it is said that they had songs of love-making and a drama.

It was while the Inca civilization was at its height that Atahualpa, the ruler of the northern part of their territory, was captured at Cajamarca and put to death by Pizarro. The Spaniards later visited Cuzco and robbed it of its treasures. They tore down the mighty temples and fortresses, erecting churches and other buildings on their foundations, and tried in every way to destroy all vestiges of the Inca Empire. From then until Peru won her independence in the war of 1821, almost three centuries later, Cuzco was in the hands of the Spanish.

THE ANCIENT CAPITAL OF THE INCAS

Ruins of the ancient buildings erected by the Incas are still being found in this valley. In Cuzco itself are the remains of structures of enormous extent. The Temple of the Sun, for instance, which was known to the Incas as the Coricancha, or "the place of gold," covered the whole square now occupied by the church and convent of Santo Domingo. The old walls of that temple, which in places extend twenty or thirty feet from the ground, form the foundation for the church. I was taken through the buildings by one of the fathers and shown how the great blocks of stone had been fitted together so closely without mortar or cement that the point of a needle could not be pushed into the cracks.

The temple was straight on three sides, with a great oval at the back. It was about twelve hundred feet long and its walls were two stories high. They were surrounded by a thick cornice or border of gold about eight inches wide, and where the wall joined the roof there was another broad golden band. The roof was covered with gold, and the inner walls of the temple were plated with it and engraved with designs of vegetables and vines. Opposite the entrance to the temple was a mighty plate of solid gold, heavily encrusted with emeralds and other precious stones, representing a human face surrounded by rays. It was the image of the sun worshipped by the Incas. They considered gold sacred to the sun, and often referred to it as the tears of their god. On both sides of the image were the embalmed bodies of the Incas of the past, each seated on a chair of solid gold.

Like the fire worshippers of Persia to-day the Incas kept burning in the temple a sacred flame that was supposed never to go out. This flame was tended by the

LANDS OF THE ANDES AND THE DESERT

virgins of the sun, who had a vast convent not far away. When the Spaniards conquered the Incas, they stripped this temple of all its gold. They melted up the images and vessels used for worship, and tore from the walls the golden plates. I am told that there were temples to the sun at many other places in Peru, and also temples to the stars and the moon. According to tradition there were also chapels to these heavenly bodies in the great temple at Cuzco.

Leaving the Temple of the Sun, I strolled up the narrow street to where the virgins of the sun had their quarters. These young women, in addition to their religious duties, are supposed to have formed a harem for the Incas. They lived in enormous structures scattered over the empire and some of their convents are said to have had a thousand members. The one in Cuzco must have covered eight acres. The walls, which still stand, surround the greater part of a square, forming the foundations of many homes built on the second story. Much of the first story has been turned into stores. The granite walls have been cut away and cave-like vaults made, in which all sorts of industry goes on. I saw a saddler sewing at harness in one cave in the wall, a shoemaker pegging away in a second, and a carpenter sawing and planing in a third. The blocks of this building are of great size and apparently they will last for ages.

Other interesting remains are the walls of the palaces in which the Incas lived. That of Pachacutec stood not far from where the cathedral now is. The original walls of the palace are still preserved to the height of the first story. The remainder of the building was built by the Spaniards, and to-day makes a fine residence for one of the



One of the riddles of the City of the Sun is why the Incas cut great stone seats in the rock overlooking the fort that guarded the capital. Some believe that here were performed special rites to the rising sun.



"My secretary put his head through the hole in the torture stone, but he refused to let me bend his legs over his back and thrust his feet through the slot, as the Spaniards used to do with heretics."

THE ANCIENT CAPITAL OF THE INCAS

rich men of Cuzco. One wall of the building is perhaps three hundred feet long, including the greater part of the block. The stones are granite, of different sizes, beautifully chiselled, and joined with unions so fine that it is impossible to put a knife blade between them. One great block about four feet square and weighing several tons has twelve angles. I have heard that gold and silver were sometimes placed between the joints as a bedding material, but I saw no evidence of this in my examination. Another legend says that the Incas knew of a plant that, when crushed, softened the stone so that it could be rubbed into the desired shape.

Some of the most remarkable buildings of ancient Cuzco were the fortifications of Sacsahuaman, which crowned the top of a hill just back of the city. This hill rises precipitously to a height of seven or eight hundred feet above the level of Cuzco. It is so steep that one has to wind about to climb it. I rode upon horseback a part of the way and then left my horse and climbed up the walls of the fort on foot. On the lower slopes of the hill, perhaps five hundred feet above Cuzco, and facing a garden made in two terraces, stood the palace of Manco Ccapac, the first great Inca ruler. This was directly under the fortifications and commanded a magnificent view of the city and valley. On the first terrace now stands a church, erected in the days of the Inquisition, and outside are some great stone instruments of torture, which were used to bring the Indians and the heretics to the Christian faith. Some of these stones had an opening shaped like a keyhole, the round part of the hole being nearest the ground, and the remainder in the form of a capital T. The hole was just large enough so that a man's head could

LANDS OF THE ANDES AND THE DESERT

be squeezed through it, his neck lying on the stone. He was put into this position face downward, and his legs were then bent up over his back and his feet thrust through the T part of the key. The torture was such that it often caused death. I had my secretary get down and put his head through the hole in one of the stones to illustrate how it was done. He refused, however, when I tried to induce him also to let me put his legs through the T.

The palace of Manco Ccapac must have been a magnificent home. Its garden-covered acres, the main part standing upon a terrace twelve feet above the church, I have described. This terrace is made of these wonderful walls, into which are fitted sentinel boxes. Walking through the garden, which is now filled with eucalyptus trees and beautiful roses, I came to the ruins of the palace itself. It was made of black granite, the blocks being very thick at the bottom and lessening in size toward the top. On the other side of the structure some of the stones have been torn away, and I could see that the thick walls were double, filled in with stones and mud. I took a sheet of paper from my notebook and tried to fit it in between the cracks, but found it impossible. Manco Ccapac's palace and its ground are now the property of a wealthy Italian merchant of Cuzco. He has planted the garden with flowers, and the trees that have grown up in it almost hide the city below.

Leaving the palace and climbing up to the fort, I found an enormous structure surrounding many acres and enclosing the whole top of the hill. The walls of the fortification are in terraces that rise one over the other. They are made of enormous blocks of granite, some of which

THE ANCIENT CAPITAL OF THE INCAS

weigh many tons. There is no stone of the same nature near by, and the blocks must have been brought from a great distance. No one knows exactly where they came from nor how they were carried up this precipitous hill, which is almost a thousand feet above the plain. It is supposed that roads were made for the purpose and that hundreds of men had to work together to move a single stone. The fort was built long before the time of Columbus, and some of its walls are in perfect condition to-day. Each section of the wall has a hole for drainage, and the whole structure is almost as smoothly cut as the palaces. I measured some stones that were fifteen feet high, and riding on horseback close to the wall beside one great block and standing in my stirrups, I was able to reach only halfway up. That stone, I venture, weighed one hundred tons.

From these fortifications I rode over the hills and plains near by, which are covered with the remains of other Inca structures. Much of the rock consists of mighty boulders, some as big as a haystack, which were cut into all sorts of shapes. One is known as the Inca throne. The original granite was cut in ledges or steps rising to a low table or bed, upon which the Inca is supposed to have lain on a couch of furs or alpaca skins, with his officials sitting cross-legged on each side of him.

Not far from this place is what is called the concert hall or amusement ground of these ancient rulers. It is an open-air court of several acres. On one side of it is a rocky hill in which seats have been cut, and under it is a tunnel supposed to have communicated with the Temple of the Sun in Cuzco, perhaps three miles away. This tunnel was closed up after some students of the Cuzco University

LANDS OF THE ANDES AND THE DESERT

became lost inside it while hunting for treasures and narrowly escaped death.

Another formation near the Inca amusement ground is known as the *rodadero*. It consists of granite blocks that look as though they had flowed in ridges down the mountain. The rocks are as smooth as glass, and their slopes are in waves much like those of a roller coaster. They are grooved, and are so formed that one can seat himself at the top in one of the grooves and have a toboggan slide of hundreds of feet, rising and falling as he goes down to the bottom. It is the greatest shoot-the-chute I have ever seen, and if it could be lifted from the top of the Andes to Coney Island it would surely make the fortune of the man who owned it.

About sixty miles northwest of Cuzco are the ruins of Machu-Picchu, which were discovered in 1911 by Professor Hiram Bingham of Yale University, and which are said to be more wonderful than those of Cuzco. It is believed that those ruins mark the site of the lost city of Tampu Tocco. One legend says that city, and not an island on Lake Titicaca, was the place from which the Incas came when they went out upon the plateau and founded their vast empire. Machu-Picchu is situated on a mountain top in one of the most inaccessible parts of the Andes, and was evidently deserted by the Incas when they made Cuzco their capital. There is no record of its ever having been discovered by the Spaniards, which accounts for the remarkable state of preservation of its temples and fortifications.

Other Inca ruins near Cuzco have been found at Ollantaytambo and at Vitcos. The latter place was probably the last stronghold of an Inca monarch. When Pizarro

THE ANCIENT CAPITAL OF THE INCAS

captured Cuzco he appointed the son of a former king as a figurehead ruler. This Inca rebelled against Spanish domination, and, gathering together an army of loyal Indians, he attacked Cuzco. His siege was unsuccessful, and so he retreated to the mountains with his followers. He lived at Vitcos for ten years, and at his death his two sons governed this last remaining vestige of the Inca empire for thirty-five years longer.

CHAPTER XVIII

THE CUZCO OF TO-DAY

MODERN Cuzco is not one tenth the size of the city that Pizarro plundered. It has now only about twenty thousand inhabitants, including Indians and whites and the half-breed offspring of the two races. It is more like a city of old Spain built during the days of Columbus than the magnificent capital it was when the Incas ruled here.

The Spaniards made of Cuzco a town of one, two, and three-story structures, built of stone or plastered adobe. Its roofs of light-red tiles sparkle under the blue sky and the bright sun of the Andes. The houses have gay-coloured walls; they are close to the sidewalks, lining the narrow, cobble-paved streets.

High above the houses rise the domes and the spires of the great churches and convents built by the Spaniards when they had grown rich by enslaving the Indians and taking the vast hoards of silver and gold they found in the city. Cuzco has a church for every thousand inhabitants, and some of them are so magnificent that they would attract attention in any city of Europe. In the centre of the town is a beautiful plaza, the site of what was once the chief square of the Inca capital. During Spanish rule it was the scene of many acts of cruelty and torture. It was here in 1571 that the boy Inca, Tupac Amaru, was beheaded after being taken prisoner by the

THE CUZCO OF TO-DAY

Spaniards. Following his capture he was instructed in the Christian faith by two priests and later baptized. On the day of his execution he was dressed in white robes and led to this plaza, where hundreds of his subjects had gathered. However, when the executioner brought out his knife and prepared to strike, such a wail of horror and protestation arose from both Indians and Spaniards that the beheading was stopped. Messengers were sent to the Viceroy of Peru at his Cuzco headquarters, asking for mercy, but their intercession was of no avail, and the execution was carried out. Afterward, the viceroy caused the head of Tupac to be set up on a pole in the plaza, but when he learned that the Inca's subjects came there each night and knelt in silent adoration and worship, he ordered it to be buried with the body.

The plaza does not now cover more than four or five acres, but five churches face upon it, including the Cathedral of Cuzco, which alone covers several acres. Across the way is the great structure of La Compañía, which was built by the Jesuits as their chief house of worship. Adjoining is the magnificent old Jesuit convent, where the monks worked and taught. When the government drove the Jesuits out, the building was turned into a university. The patio about which the holy fathers strolled is now used as a tennis court, and as I passed by I saw the students driving the balls back and forth over the net.

Another great church is La Merced, through which I was guided by a young priest. Its interior is a mass of carving, including fluted stone columns and a ceiling panelled in cedar. The Church of Santo Domingo stands on the foundation of the old Temple of the Sun, as I have already

LANDS OF THE ANDES AND THE DESERT

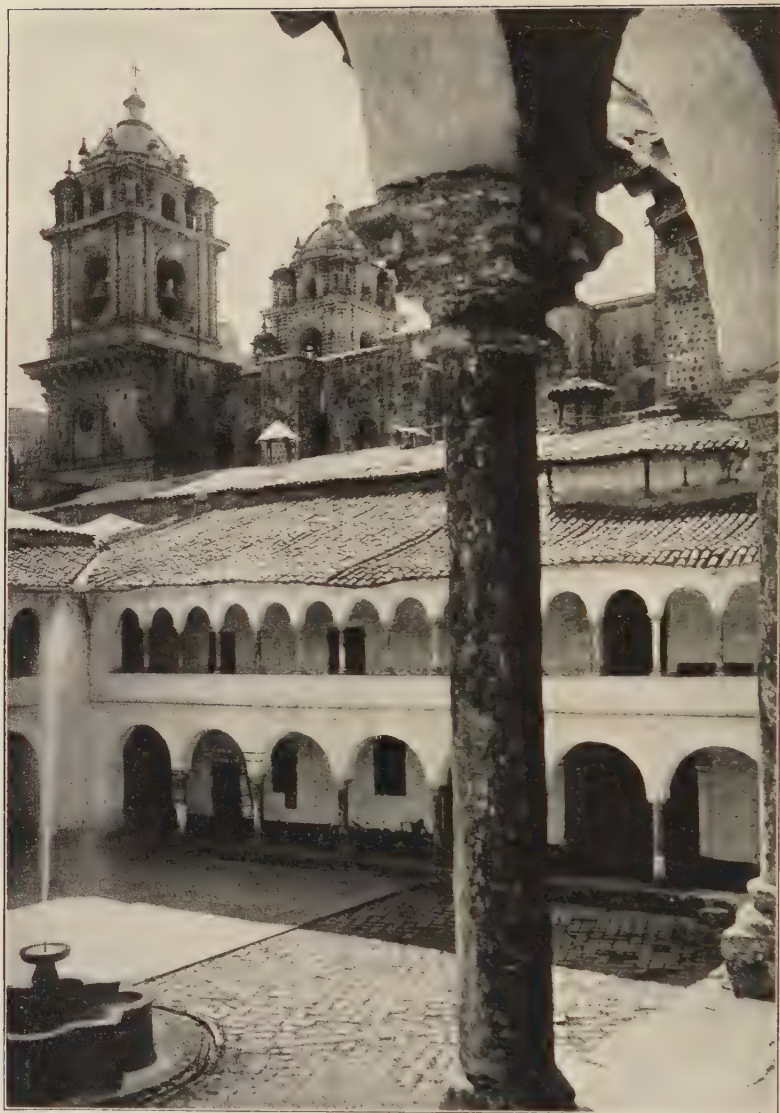
pointed out, and that of San Francisco has a choir famous for its rich carving. The little chapel of San Blas has the finest wood pulpit in the world. It was carved by the descendants of the Incas, and is considered so unusual that twenty-five thousand dollars was recently offered for it.

The Cathedral of Cuzco is one of the finest of all the Catholic churches in South America. It is particularly noted for the beautiful tone of its bell, said to be due to the large amount of gold it contains. Three hundred pounds of the precious metal was given by one woman, by whose name, Maria Angola, the bell is now known. The cathedral is a vast museum of carvings plated with gold, of wonderful paintings, some of them by old masters, and of chapels with altars of solid silver and woodwork inlaid with gold. Some of the paintings are forty feet high and twenty feet wide, and there is one of the Last Supper that measures about thirty by forty feet. A few are by Murillo, one is by Van Dyck, and several are the work of Domenichino. One of the altars was presented by Charles V of Spain, and some of the paintings were given by Philip II.

In one of the walls of the sacristy is a vault filled with treasures, including gold, silver, and precious stones, valued at more than a million dollars. In this vault is the *custodia*, a box that contains the sacrament used at the time of processions. This box weighs thirty-six pounds and it was made of the solid gold plates taken from the Temple of the Sun. The diamonds and emeralds on it are worth even more than the gold itself. These treasures are stored away in a closet with a door of wrought iron so rude that it could be opened by any safe-breaker



Many of the buildings of modern Cuzco are built upon the ancient Inca structures. The latter are distinguishable by their sloping walls of cut stone blocks beautifully fitted together.



With its university and cathedral, Cuzco was for centuries a stronghold of the religion and culture of the Spaniards, just as it had been the religious and political capital of the sun-worshipping Incas.

THE CUZCO OF TO-DAY

or ordinary burglar. It is, perhaps, the reverence of the people and their fear of damnation that preserve the contents of the vault from theft.

One of the treasures in the cathedral is a life-size statue of Christ fastened to a wooden cross by great nails of gold. The figure is decorated with jewels, and the pedestal or car upon which the cross stands is plated with silver and encrusted with diamonds. This image is greatly revered in Cuzco. It is carried through the streets on Good Monday, at which time the people kneel down on the sidewalks before it and pray. They call it the Lord of the Earthquakes and think that their city is safe from seismic disturbances as long as the annual procession takes place. This belief comes from a tradition that once when the statue was left in the church beyond the hour usually set for the procession, the mountains began to sway and an earthquake occurred. Thereupon the image was brought out and the earth ceased its quaking.

As I stood in the cathedral, mass was being celebrated. Two hundred women, dressed all in black, with black shawls over their heads, knelt on the stone floor. Sprinkled among them were patches of colour made by the Indian men, who wore ponchos of red, blue, or yellow, and whose bare feet were turned up to the roof as they muttered their prayers. There were also Indian women in short skirts and red shawls, each with a pack or a baby on her back.

There is no doubt about the religious nature of these people of the high Andes. The Quichuas, who are the descendants of the subjects of the Incas, are the chief churchgoers of Peru. It is they who furnish the chief support of the priesthood, and although in direst poverty,

LANDS OF THE ANDES AND THE DESERT

they give much of what they earn for the maintenance of the Church. In travelling through the country I saw a little wooden cross rising above the thatched roof of every Indian hut, and the services at the cathedral here are attended by more Indians than whites. Along with their worship of Christ and the Virgin Mary they still retain many of the ancient ceremonies and beliefs of the Incas. They pray facing the sun, and they cross themselves and offer a prayer when they approach or leave Cuzco, the sacred city of their ancestors.

Crossing the plaza from the cathedral, I visited the *portales*, or stores, where Indian goods are sold. They occupy the ground floors of a block of two-story houses, the upper stories of which extend out over the street and are upheld by stone columns, forming an arcade. These stores are like caves in the wall, and their doorways look as though they were cut out with a cross-cut saw. I arrived in Cuzco on a saint's day, when the shops were hidden behind thick slabs of wood that come together like the folding doors of a barn and are fastened with great wrought-iron padlocks centuries old. Single locks weigh ten or twenty pounds, and they are so constructed that one must use a half-dozen keys to open them.

All the storekeepers are women. They are fat *cholas* who wear very full skirts and keep their shawls and hats on while attending to business. Many of them do some manufacturing in addition to their selling. Kneeling or sitting on the floor, they make various garments with little hand sewing machines that they rest on boxes or chairs.

From these shops I walked around the corner and up a narrow street walled with stores that are larger but have the same cave-like entrances. One block is called Coca

THE CUZCO OF TO-DAY

Street, because every shop on each side of it has bales of coca leaves among its wares. These leaves, which are the source of our cocaine, are chewed for their narcotic effect. I noticed that all of the Indians bought coca, and that most of them had quids of these leaves in their cheeks at the time.

Going on, I passed an ancient fountain where Indian house servants were filling their water jars. This fountain represents a young girl with what looks like a chrysanthemum over her head, on the top of which is a cross. The figure is nude and out of the breasts pour two continuous streams of water.

A little farther on I stopped to look at the market. Half of the plaza where it is located is covered with long galvanized iron sheds. Under the sheds are zinc counters upon which meat is spread out for sale, and farther on are sheds for vegetables, where the Indian women sit on the stones with their wares piled around them. Still farther on are sheds for fruits, and in the open spaces out in the sun llama droppings and charcoal are being sold as fuel. There are other peddlers here and there, and scattered about are cook shops, where the Quichua Indians are eating soup and fried stuffs cooked on clay stoves or sheet-iron plates.

I asked as to the prices of the various goods I saw and learned that meat costs the same whether it comes from a lamb or an old ram, and without regard to the cut. Having no scales, the butcher women guess at the weight. Neither are vegetables sold by measure, but in piles. The usual price per pile is two and one half cents in our money, the size varying in accordance with the article. Here is a woman selling red peppers, for example. She has before

LANDS OF THE ANDES AND THE DESERT

her a cloth covered with piles containing ten each. In the next stall are handfuls of green beans, and beside them cakes of native cheese the size of a biscuit, which can be bought for a nickel. A little farther on a woman is selling quinoa and kernels of corn half as long as one's finger. The corn is of many colours and varieties. Some is as black as my boots, some bright yellow, and the next pile is dark red. Hominy grains as big as the end of my thumb are sold wrapped in a cloth that looks like a dirty dish rag.

I am interested in the potatoes. Peru is their natural home, and the great-great-great-grandfathers of all our potatoes were born on this high plateau of the Andes. The tubers are of all sizes; some are as big as my fist, others no bigger than a thimble. They are equally varied in colour—black, red, and yellow. I see also much *chuño* being sold. *Chuño* looks like bits of bleached bone, but is really potatoes that have been frozen and dried so that they can be kept for years without spoiling. It is prepared from a special variety of potatoes about the size of a baseball. They are first soaked in water overnight. Early in the morning, before the sun rises, they are taken out and allowed to freeze. They are then covered with straw to keep off the sun. The next night they are soaked and frozen again. This process is continued from night to night until the potatoes become soft, when the Indians tread off the skins with their bare feet. The potatoes are now as white as snow, and after being dried will keep a long time. They have to be soaked before cooking and are usually served in a soup or a stew. Sometimes they are sliced and eaten as sandwiches with cheese between the slices. I have eaten *chuño* made into stew, but found it insipid. Perhaps it might have been more



Under the *portales* facing the plaza where executions formerly took place, are the cave-like stores where fat *chola* women sell all sorts of wares, many of them native goods made on the spot.



The streets of Cuzco, where one now sees stolid Indians and plodding donkeys, have witnessed stirring scenes in the past, when the Spanish conquerors practised barbaric cruelties to hold the fallen Incas in submission.

THE CUZCO OF TO-DAY

appetizing to me had I not seen so frequently how it was prepared.

It is interesting to watch the market women. The *cholas* wear straw hats and shawls, and skirts that reach almost to the ankles. They have lighter complexions than the full-blooded Indians. The latter women have hats like pie pans, with upturned brims and low crowns. They wear also shawls of red, blue, yellow, or black, and embroidered waists and voluminous skirts that stand out like those our girls wore in the days of wire petticoats. They carry bundles on their backs and often babies on the tops of the bundles.

There are hundreds of Indian men walking through the market, buying and selling. They have flat round hats with upturned brims, underneath which are bright-coloured knit caps with ear flaps that hang down to their necks. Some of the Indians are driving llamas loaded with goods, and some carry on their shoulders great packs containing vegetables and other products that they have brought in from far away in the country. The whole scene is one of bright colours, but it is not noisy, and the people are apathetic and dull. They talk in low tones, and they seem very timid. When I point my camera at them the women hide their faces and the children howl and go off on the run.

One of the odd sights of the market, and also of the streets throughout Cuzco, is the traffic and the way freight is carried. Nearly everything comes in from the country on donkeys, mules, or llamas, or on the backs of men and women. There are not more than a half dozen automobiles in the city, and most people go about on foot or on horse- or mule-back. When I arrived in Cuzco on

LANDS OF THE ANDES AND THE DESERT

a former visit to Peru, the station master had been instructed by the superintendent of the railroad to see that I got to my hotel, and as I had a great deal of baggage I asked him to hire a carriage. He replied that there were no carriages in Cuzco, but that we could take the street car, while my typewriter and trunks could be carried on the backs of Indian *cargadores*. I found the street car to be a long box resting on wheels, with a team of four shaggy mules as the motive power. There were a half dozen such cars, each with its separate team, and they were so crowded that I was barely able to get standing room. The cars ran only to the trains, which arrived and departed three times a week, so that if one could get a ride a day he was lucky. It was about a mile and a half from the railroad depot to the main plaza, and our mules went on the gallop.

My hotel is run on the European plan, and I am able to get two good rooms at a reasonable rate. We take our meals at a hotel that faces the great plaza and the cathedral. The entrance to this house is a cave-like passageway through evil-smelling and dirty courts, and it is only when I reach the dining room that I dare to cease holding my nose. Once there, the accommodations are fair. The food is Peruvian, but the eggs are fresh and the meats are good. The landlord tries to please, and his price for three meals is low.

Altogether, I am delighted with Cuzco. The sky is blue, the sun is bright, and the surroundings full of interest. On one hand are the quaintness of the present city and the strange costumes of the Indians, and on the other are the ruins of the Incas and the romance of a civilization that has passed away.

CHAPTER XIX

STORIES OF BURIED TREASURE

I HAVE heard stories of buried treasure all along the Andes from Panama to southern Peru. The Incas had vast stores of gold and silver that for four centuries white men have been attempting to recover. Only a few weeks ago I met a party of Americans and British in Cerro de Pasco who were prospecting for one of these hoards. They had already spent thousands of dollars, and were spending more every day.

I heard other stories at Urcos, a little mud town on the railroad just south of Cuzco. It is high up in the Andes, more than two miles above the sea, and not far from Lake Urcos, in which Inca treasures are said to be buried. When the Spaniards under Pizarro had killed the Inca king, Atahualpa, they marched upon Cuzco. The Indians knew the Spaniards' greed for precious metals, and they took most of their treasures from the capital city and buried them. According to tradition, they threw millions of dollars' worth of gold into this lake, among other things the great golden chain that surrounded their main plaza. This plaza was about five hundred feet long and several hundred feet wide, so that the length of the chain was probably nearly two thousand feet. It was made of pure gold, wrought into links about a foot long and as large around as my wrist. The links were so heavy that a man could not lift more than one of them at a time, and hun-

LANDS OF THE ANDES AND THE DESERT

dreds of Indians were required to carry the chain to the lake. It is supposed to lie there to this day, although many have searched for it in vain. The treasure hunters have dived into the waters and have raked over the mud near the shore. They have also used grappling hooks to drag the bottom, which in places lies hundreds of feet below the surface. At one time a syndicate, capitalized at five million dollars, was organized to tunnel the mountain-side and drain the lake in order to get at the gold. The difficulties encountered were so many, however, that the enterprise was abandoned.

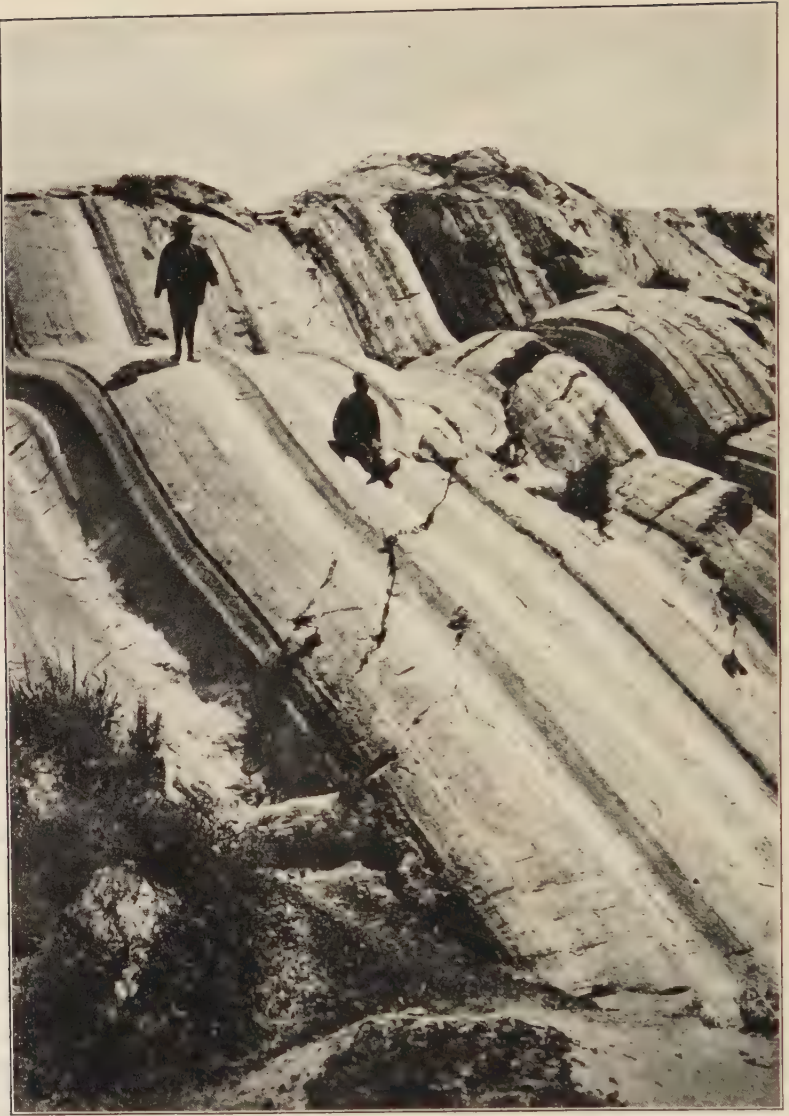
All the ornaments and the utensils used in the religious ceremonies of the Incas were made of gold or silver. In the Temple of the Sun were golden ewers that held the water used at the time of sacrifices; and there were twelve silver jars kept filled with Indian corn. There was a golden llama with golden fleece, and also golden birds and golden flowers, all of life size.

The Spaniards found a vast amount of gold in the cemeteries of the Incas, the precious metal having been buried with many of the monarchs. There is a record of one Garcia Gutierrez paying to the Spanish crown one fifth of the treasures he found in the graveyards at Trujillo, which netted him more than six hundred and seventy-seven thousand castellanos of gold. Gold and silver plates have been found fastened to the heads of mummies and skeletons dug up in the excavations at Tiahuanaco in Bolivia.

The building of the great cathedral in Cuzco is said to have been brought about by the discovery of Inca treasure. According to the legend, it began with a miraculous dream of the bishop, in which the Virgin Mary appeared before



The Spaniards first plundered the Inca temples and palaces of their gold and then destroyed them and they even failed to record how the Indians roofed these great structures without knowing the use of the stone arch.



Whether the Inca kings, or perhaps a race of giants, had this huge slide carved out of the granite for the amusement of their children, or whether it occurred naturally, no one knows, but it still furnishes sport for the youths of Cuzco.

STORIES OF BURIED TREASURE

him and told him that she wanted a cathedral in Cuzco. She fixed the location on the ancient plaza of the Incas and described the building as it now is. The bishop replied that his people were poor, and that he could not possibly raise the sum needed. Thereupon the Madonna directed him to go to a place near Cuzco and dig. This was duly reported to the people, who, as the story goes, went with the bishop in a great procession to the spot designated. They dug down into the earth and there found a large store of gold. It was with this gold that they began to build the cathedral, which is, as I have said, one of the finest churches in the new world.

A second story of lost treasure relates to a Cuzco man of Spanish descent whom the Lord blessed with numerous children. It is the custom here that a godfather shall look after and provide for his godchild; and so, as this man was poor, he tried to add to his resources by having a corps of good godfathers. As the infants were born, he named each in honour of one of the distinguished citizens of the town. The citizens, however, did not respond, and the man grew poorer and poorer. At last he had nine children, each of whom had a rich godfather, but there was no help forthcoming. The father then vowed that he would choose as the patron of his next child the first man he met on the street after its birth. In due time the stork came again, and the father, rushing out of the house, saw a poor Indian driving a caravan of llamas into the town. He stopped him and asked him to be godfather to the child. The Indian objected, saying that he was poor and not fit to be godfather to a white child. The man then told him of his vow and finally persuaded the Indian to accept the honour.

LANDS OF THE ANDES AND THE DESERT

When the baby was baptized, the Indian appeared at the ceremony as its godfather, and the next day came back into Cuzco with a score of llamas loaded with wood. He took the wood to the father of his godchild, saying that he had brought what he could as a gift. He was thanked and the wood was stored away in the court of the house. Some time after that the bundles of sticks and roots were opened, and inside each was found a bag of gold in nuggets and dust. In the meantime, the Indian had disappeared and could not be found. The Spaniard took the gold and built two large houses on the street called Triumph, which the people of Cuzco will show you to-day.

✓ Another treasure story is the tale of an Indian woman one hundred years old. It relates to a great hoard of gold that was hidden in the Andes by an Indian chief, who was murdered on his way back to Cuzco. It had long been searched for in vain by both foreigners and Peruvians. Not long ago this old Indian woman, being about to die, sent word to a *ba endado* of Spanish descent for whom she had worked, asking him to hasten to her. He reached her hut in the mountains just in time to get her last message. This was that her maternal grandmother, who had died eighty years before, had given her a word that would indicate where the treasure lay. The word was an Indian one meaning the Lake of the Two Stones. The old woman was questioned, but she would tell nothing more, and that night she died. The whole country was searched by treasure hunters, all seeking the Lake of the Two Stones. At last a narrow valley was discovered containing a lake in which there were two tall rocks rising out of the water. The lake was drained, and the treasure was found in a chamber under the largest stone. The discovery was kept

STORIES OF BURIED TREASURE

a secret from the officials for fear of confiscation, and so no one knows how much gold was discovered. It is said to have been of such great value that it made wealthy all those who participated in finding it.

Still another Indian legend tells the story of a treasure cave in a mountain near Cuenca in Ecuador. This cave contains a mighty store of gold, but its entrance is closed by a giant of granite under whose arm is a hole that is open only on Good Friday. Then, and then only, the giant raises his arm, and whoever is there at that time can crawl in under it. As the story goes, the gold is in piles, and only one pile is to be taken at a time. If a man takes only the assigned quantity he will get away safely. But if he is greedy and takes more he will be squeezed to death by the arm of the giant as he goes out. The Indians have great faith in this story, and many superstitious people have looked for the cave, hoping to reach it in time for Good Friday.

A fairly well-authenticated tradition refers to an Inca named Ruminagui, who is said to have carried away the gold and silver of Quito and buried it. This treasure was taken from the palaces of Atahualpa and from the temples and the convents of the virgins of the sun. It is said that some of the gold was intended to be sent to Cajamarca for Atahualpa's ransom, but that Ruminagui, anticipating the treachery of the Spaniards, buried the treasure on the way. News of what he had done came to the Spaniards, and Sebastian de Benalcazar, one of the subordinate officers under Pizarro, took one hundred and fifty men and started for Quito. He searched along the route followed by Ruminagui, but found nothing.

In the meantime, Ruminagui had dug traps in the trails

LANDS OF THE ANDES AND THE DESERT

and made snares to destroy the enemy and their horses in case he was followed. Also, in order to save them from the Spaniards, he had set fire to Quito and killed the virgins of the sun before Benalcazar appeared. He then climbed to a high mountain behind the city, where he was finally captured by Benalcazar. He was tortured to make him tell where the golden hoard was secreted, but refused to talk, even though finally put to death.

An Indian boy named Catuna, the son of one of the Inca chiefs, who was with his father at the time this hoard was secreted, was injured in one of the battles and left as dead. Captain Suarez, a Spaniard, later discovered that Catuna was still alive, and took the boy home with him. Catuna's injuries were so severe that his features were distorted and he became a hunchback. Captain Suarez taught him to read and write, and converted him to Christianity.

Later, Suarez became unfortunate in his speculations, and his house was about to be sold to satisfy his creditors. Then Catuna said that he would produce enough gold to pay off the debts if he were given some equipment for smelting. He also made Suarez promise to say nothing as to the source of any sudden wealth. This was agreed to, and Catuna, working in a secret vault under the house, supplied so much treasure that Suarez became a rich man. He gave large sums to the Church, and when he died in 1550 he made Catuna his heir. When questioned as to where the money came from, Catuna said that he had made a compact with the evil one, to whom he had sold his soul for this gold. This statement was credited, because at that time the Indians were believed to have regular intercourse with the devil.

STORIES OF BURIED TREASURE

After Catuna's death his home was searched and the vault discovered. It contained a large quantity of gold in ingots and bars, and also in vessels of gold that evidently came from the Incas. The people, however, persisted in believing that the story of the pact with the devil was true, "and," says Father Velasco, from whose letters this story comes, "the truth would have never been discovered if it had not been that Catuna's confessor, a Franciscan monk, had left a written account of the burial of Atahualpa's treasure, which had been told to him."

I heard a story in Cuzco of an Indian girl who was in love with a Spaniard, and who told him that she would make him the richest man in Peru if he would marry her. He promised that he would if she would prove that she could do what she proposed. At her request, he went with her one night into the mountains, where he was blindfolded and led through ravine after ravine. They finally reached a cave where the bandages were removed from his eyes, and his sweetheart said:

"Behold! There is the gold that I am ready to give you when we are married."

The Spaniard looked down and saw a great pile of golden bars and a collection of golden vessels curiously carved, probably from the treasures of Atahualpa. He attempted to seize some of the largest pieces near him, but the girl pulled him back, saying:

"Those things are sacred until we are wedded, and if you attempt to touch any of them or take away any, my friends who are here at hand will certainly kill you."

The Spaniard, becoming frightened, threw down the gold and submitted again to being blindfolded. Upon his return to Cuzco he told the story to the authorities and

LANDS OF THE ANDES AND THE DESERT

an order was issued for the arrest of the girl. The police hastened to her hut, but were too late. The girl and her family, hearing of the proposed arrest, had fled to the mountains, and that was the last ever known of the treasure.

There are records left by the Spaniards describing several localities where they thought some of the Inca treasures might be found. One such record is in the writings of Valverde, who died in Spain. He was known to have gone many times into the mountains of Ecuador and to have brought out a great quantity of gold, the form of which showed it to have been a part of the treasures of Atahualpa.

Valverde left directions giving the route to where the gold lay, and the King of Spain sent this description to Ambato, a town now on the railroad between the coast and Quito, ordering the officers there to search for the treasure. The manuscript of the king's letter, which I understand is still preserved, tells the searcher to stand on the mountain of Guapa, with his back to Ambato, and look to the east. From there can be seen three mountains in the form of a triangle surrounding an artificial lake, into which the ancients, when they heard of the death of the Inca king, threw the gold they had prepared for his ransom. The Spanish directions then tell one just how to get there and the dangers he is liable to incur on the way. He is supposed to reach a bog in which is gold that can be washed out in a stream near by, and still farther on is said to be a cave in which is a furnace where the Indians melted their ores. Many have searched for this treasure, but it has never been found.

A treasure hoard that really existed was found on the

STORIES OF BURIED TREASURE

farm of a Spaniard who had built a wide and apparently unnecessary adobe wall between two of his fields. Before he died he left strict injunctions that the land on which this wall was built was never to go out of the possession of his family. Years passed, and the great-great-grandson who had inherited this piece of land finally offered it for sale in order to raise money to meet his debts. The descendant of another branch of the family, remembering the story of his ancestor's last instructions, bought the property and immediately put all his peons at work demolishing the wall, long an eyesore to the neighbourhood. Under it were found bars of gold and silver amounting to many times the value of the property.

The finding of treasure in old buildings led many people to tear down their houses and devote much time and expense to searching for secret chambers and passages that might conceal untold wealth. One man, who actually discovered such a passage, found that it ended in a brick wall, which he assumed to be the outside of a treasure vault that had been closed up years before. Working in great secrecy, he pried the bricks out one by one, and at last saw a large room filled with silver vases, candlesticks, beautiful china, and linens exquisitely embroidered. In his great excitement he failed entirely to notice that everything was spick and span and in the finest condition, and it was only when a woman entered through a hitherto unnoticed door that he discovered that he had merely chiselled his way through the wall of his neighbour's house into his pantry.

CHAPTER XX

SLAVES OF ALCOHOL AND COCAINE

AT THE time of the Spanish conquest it is estimated that there were between twenty and forty millions of semi-civilized Indians on the high plateau of the Andes. There were the Chibchas in Colombia, the Caras and Chancas in Ecuador, the Quichuas in Peru, the Aymarás in Bolivia, and farther south in Chile the brave Araucanians. The Chibchas were skilled in weaving and making pottery. They had learned to pave their highways, and had developed their farming to a high degree of productivity. They had weights and measures, and a currency of gold disks. The Caras had attained an advanced civilization, with a military and a tribal organization, and the Araucanians met in grand councils to make laws and settle matters of public interest. The Aymarás, the chief race of Bolivia, ranked in progress with the Quichuas. To-day, the majority of the Quichuas are as miserable and degraded as any human beings on earth. Not one in a hundred can read or write. They are mere hewers of wood and drawers of water, slaves to the coca leaf and alcohol. They are a race from which active mentality seems to have departed, and have shrunk in numbers from eight millions in 1575 to a bare million and a half.

I saw the Quichuas first in the high valleys of Ecuador, and found them everywhere as I went through Peru. I



Past oppression, combined with his addiction to alcohol and coca chewing, has degraded the Indian of the plateau until he has become a dull, apathetic being, desperately poor, and without curiosity, ambition, or hope.



Like the aborigines of our own Southwest, the Indians of the Peruvian plateau are capable pottery makers, although their sense of colour is greater than their understanding of drawing and decoration.



The Indian market women sit all day long on the cobble paving with their wares heaped about them. Weights and measures are unknown to them and they sell fruits and vegetables "by the pile."

SLAVES OF ALCOHOL AND COCAINE

have seen them toiling along the trails with enormous loads on their backs, or driving their laden llamas and donkeys to the markets of the cities. In the towns I have watched them sitting on the stone pavements of the plazas with their little stores of vegetables spread out before them, or carrying barrels of water and other burdens from house to house as the servants of the *cholos* and the whites.

In my trips to South America I have not had time to make an exhaustive study of the Quichuas, but I have obtained much information about them from men who have lived in these countries for years. I have talked with plantation owners and mining operators, with teachers and missionaries, and, in fact, with scores who employ Indians or are otherwise interested in them. An extreme view of their condition was given me by an American mining official, who is a man of keen observation. He said:

"Most of the Quichuas of the plateau appear to lack ordinary intelligence. If you tell one to fetch you a broom, he will bring you a shovel. If you send him for a hatchet, he will, as likely as not, return with a glass of water. If you knock him down and make him go back, the shock starts his brain working and he may then get what you asked for."

Another American, who has been here for many years, tells me that the Indian boys are intelligent until they reach the age of fifteen. They acquire the coca habit almost at birth, but they do not take to alcohol until they begin to work independently of their parents and can afford to buy liquor for themselves. From then on they deteriorate, and they are on the down grade for the rest of their lives.

LANDS OF THE ANDES AND THE DESERT

I believe that the cause of the mental degradation of the Quichua is due somewhat to oppression by the whites, but more to the use of alcohol and coca. Coca has been chewed by the Andean Indians since the days of the Incas, when any feat of strength or endurance was attributed to its use. In athletic contests the victor's reward was a coca pouch woven in brilliant colours, the handiwork of an Indian maiden. Accompanying it was a small gourd containing lime or ashes to enhance the flavour of the coca. It was always a part of the equipment of the soldier on the march, and distances between different parts of the Inca Empire were often reckoned as so many handfuls of coca, meaning the amount of leaves necessary to sustain a man in making the trip. According to one writer of that period,

Three leaves supply for six days' march afford.
The Quitoita with this provision stor'd
Can pass the vast and cloudy Andes o'er.

Coca was used also as an offering to the sun and to make smoke at sacrifices. One of the Inca ceremonies was to throw it into a river and allow it to float downstream, while parties of Indians kept pace with it on the banks for days. So that a man could have it to chew in the next world, pouches of it were usually buried with the dead.

Every farmer gives his Indian labourers a handful of coca leaves each morning, and every mine owner has to supply a certain amount in addition to the regular wages paid. The full effect of the cocaine is obtained by rubbing the leaves between the palms to remove the tiny branches, chewing them into a ball, and then adding a small amount of lime, which is sold in the markets in the form of little cakes. The Indian not only chews coca, but he often

SLAVES OF ALCOHOL AND COCAINE

brews from it a tea that he says he takes for his stomach's sake, but really for its effect as a stimulant.

Coca drives away hunger and makes one feel the cold less. It enables one to breathe with greater ease in the high altitudes of the Andes, and it is claimed that by using it the Indians can work longer and endure more fatigue. I am told that chewing it also keeps the teeth white, and it is said that the Quichuas seldom suffer from toothache. Whatever its temporary effect may be, coca also numbs the brain, destroys the will, and dulls all forms of mental activity.

Coca leaves come from a shrub that grows from four to six feet in height. They are picked green, dried, and put up in packages of twenty-five pounds each, which sell for about two dollars and a half. I bought ten cents' worth at one of the stores of Cuzco. The woman who waited upon me brought out a pair of old brass scales, balanced on the end of a beam, and weighed out a full pound. I took it home and chewed some, but it had no perceptible effect, probably because I had not the lime to go with it. I then made some into a tea, which made me feel very refreshed.

As to alcohol, the extent to which it is used among the Indians is beyond conception. Drunken men and women by the score may be seen at any celebration, and in every part of the country Indians with red faces and bleared eyes go reeling along the roads. The women drink quite as much as the men, and on holidays both sexes give themselves up to drunken carousals.

During my stay in Cuzco I went into some of the alcohol stores, and was astounded at the vast quantities sold. There was a wholesale and retail liquor establishment

LANDS OF THE ANDES AND THE DESERT

just opposite my hotel. The storeroom facing the street was walled with tanks, each twice as high as a man and as large around as a boiler. I counted twelve such tanks standing upon platforms against the wall of that room. Each was marked as containing two thousand litres of alcohol, and when I tapped upon them with my knife I found they were full. That meant more than twenty-four thousand quarts. Every tank had its faucet, and the liquor was drawn out by the gallon, the litre, or the bottle.

The storekeeper seemed proud of his business, and told me that he made a million and a half pounds of liquor every year. He sells it to the Indians for about ten dollars a quintal, or one hundred pounds, and ships it to other towns throughout the province. He told me that the hacienda Pachacha, where the brandy is made, consists of four great farms ninety miles from Cuzco, and requires from eight hundred to one thousand Indian families to work it. Going into a court, I saw the goatskins, containing one hundred pounds each, in which the liquor is brought from the plantation. When I drank some it burned my throat like liquid fire, and as I remarked upon its strength the shopkeeper took a gauge and showed me that it was fifty-three per cent. pure alcohol.

I saw other alcohol stores in Sicuani, and there are scores of them in Arequipa and in almost all the towns of the mountain districts. The Indian usually buys his liquor by the bottle, the number of which is limited only by the amount of money he has.

In addition to alcohol, the Indians—men, women, and children—drink *chicha*, made from corn. It is for sale in the stores, and may be obtained at wayside saloons everywhere in the mountains of Peru. The first step in the



Market day in the mountain towns affords a colourful spectacle. The Indians frequently travel thirty or forty miles for the occasion, although their total sales or purchases may amount to no more than a few cents.



The usual home of the plateau Indian is a rude hut of adobe or plastered stone, containing practically no furniture. The chief work of the women, cooking and weaving, is done out of doors.



Ownership of a few llamas gives the farmer means of getting his products to market, and also furnishes him coarse wool for making rough cloth, while their droppings provide fuel in a land of almost no wood.

SLAVES OF ALCOHOL AND COCAINE

manufacture of *chicha* is to put the kernels of ripe corn into tanks in the earth. The corn is then sprinkled with water and covered with straw. It is kept wet until it swells and sprouts, after which it is taken out and boiled for a time. The liquid begins to ferment in a day or two, and is soon ready to drink.

I am told that the old-fashioned way of making *chicha* still prevails in some villages. By that method the Indian girls shell off the ripe grains and grind them between their teeth, working their jaws until the saliva flows freely. When chewed sufficiently the saliva-soaked meal is ejected into a wooden trough. The spittle starts fermentation, and after a short time the mush, with some water added, has turned to a liquor with a high percentage of alcohol. It is said that this is the most intoxicating form of *chicha* known, and that its manufacture dates back to the days of the Incas. Kava, the intoxicating drink of the Samoas, is made in a similar way.

As I see how the Indians live and work on these cold highlands of the Andes, I do not wonder that they are driven to coca and alcohol. Their homes are huts made of mud, so rude and squalid that in the United States they would hardly be considered fit for a cow stable or a hog pen. The typical dwelling is about eight or ten feet wide and perhaps ten or fifteen feet long, and it is so low that as an average-sized man stands outside it his head reaches above where the sloping roof begins. It has walls of sod or mud, and its roof is of straw tied to poles. It has no windows, and the only door is a hole in the wall so low that one has to stoop to go in. There is no furniture, although some of the huts have a mud ledge at the back, upon which the family sleeps at night. Usually, however,

LANDS OF THE ANDES AND THE DESERT

grown-ups and children lie down on the ground on llama skins and huddle together to keep warm. They sleep in the same clothing they wear in the daytime, covering themselves with coarse blankets. Often the chickens and sometimes the hogs sleep in the hut with the family. The Americans who employ large numbers of Indians at Cerro de Pasco and furnish quarters for them at a low rent have to order the hogs cleared out of the huts every few weeks.

Meals are cooked on a little clay stove in one corner of the house. The fuel is the droppings of llamas and cattle, peat, or the stunted vegetation of the pampas. There is no chimney, and the smoke blackens the roof of the hut and escapes through the door. The Indians exist on a limited diet, consisting of mutton or llama meat and potatoes, barley, *chuño*, or corn, which they soak and cook as a stew.

Most of the farms and the haciendas on the Andean plateau are owned by the whites or the *cholos*. Some of the estates are so large that one may ride all day across them without reaching the boundaries. On all of them are large numbers of Indians who lease patches of ground on such terms as make them practically the slaves of the owners.

I have had a long talk with a *hacendado* who owns almost three hundred thousand acres of land near Cusipata, in the province of Paucartambo. He spends only a part of the summer there, and lives for the rest of the year in Cuzco. He talked freely of conditions on his hacienda, looking upon the practical enslavement of the Indians as a matter of course.

"Land here is cheap," he said. "The estate at Cusipata cost me only about four cents an acre when I bought it some years ago. Including the livestock, I paid only twenty thousand *soles*, or about ten thousand dollars, for

SLAVES OF ALCOHOL AND COCAINE

the property. The highest land, which runs up to sixteen thousand feet above the sea, is suitable only for pasture. I have big flocks of alpacas and llamas, and about eight thousand sheep, as well as cattle and horses and donkeys. I have also some land as low as ten thousand feet, upon which barley, potatoes, quinoa, and other crops can be grown.

"The most important asset on the property, however, is the Indians. It is valued, not according to its area, but by the number of families of Indians who have homes upon it and are therefore obliged to work for me. If it were not for the Indians living on the estate, I could get no one to work my land. Therefore, I hold them by keeping them more or less in debt to me. I advance money for the purchase of cattle, llamas, and alpacas, and for feast days and marriages and funerals. The only way an Indian can get out of debt to me would be by finding some other proprietor to assume his obligation. In that case he could move, but he would be only going from one master to another.

"Some of the Indians are in debt only thirty or forty dollars, and others owe as much as three hundred dollars. I loan them money according to the value of their stock, being careful not to let them have more than the animals would bring at forced sale. One of my Indians owns four hundred alpacas, and some own sheep and cattle to a value of three or four hundred and even a thousand dollars. Such men work on the same conditions as the others, and do not live any differently.

"According to my contracts, every Indian man has to work for me five days of each week, which leaves only Saturday and Sunday for himself, with the exception of

LANDS OF THE ANDES AND THE DESERT

holidays and saints' days. He receives no wages except an ounce and a half of coca a day. That is about a handful, and it costs only four cents a week per man. It is also agreed that each of the three Indian villages on the farm shall furnish me a man-servant, or pongo, and a woman-servant to work in my house or for someone else if I direct. The pongoes are changed from month to month, and a new one is always on hand before the old one leaves.

"The Indians also agree not to trade with a stranger without my permission, and to give me the first chance to buy anything they sell. As a rule, they will not do business with any one else under any circumstances, not even if the prices offered were ten times what I pay. In return for the use of pasture land, the Indians also give me ten per cent. of the increase of their flocks and herds. At certain times of the year all the sheep and the cattle must be branded and counted in order that I may collect my share of the stock.

"My estate is fifty-four miles from Cuzco, and the Indians who own llamas must take the products to that town or to anywhere else I may direct. For the trip to Cuzco I pay them two dollars for 2750 pounds, and furnish their food for the journey. It takes them about a week to go to Cuzco and back, and they sleep at night on the road. I allow the Indians to keep as many llamas as they please, for every animal adds to the freight-carrying facilities of my property."

"But doesn't this method of carrying crops to markets so cheaply compete with the railroads?" I asked.

"Of course it does," replied the *hacendado*. "Why should I use the railroad to market my crops when I can have my Indians do it for practically nothing? I would



Every male citizen of Peru is entitled to go to the polls when a president is being elected, but a large element of the population, especially in the interior, is unqualified to pass such simple tests as we require of our voters.



Because of the great altitude of Lake Titicaca, only a few crops, such as potatoes and barley, can be raised on its shores, and scarcely enough of these to feed the scanty population.

SLAVES OF ALCOHOL AND COCAINE

not give a centavo to have a railroad go through my estate. If it did, my family and I would be the only ones to use it. If I send my goods to market on the backs of llamas, it takes a little longer, but if the weight is short when they reach their destination the Indian is responsible. Suppose I ship a hundred pounds of barley to Cuzco by rail and it arrives four pounds short. I could not get damages from the railroad, but I could compel the Indian to make up the deficit. He is responsible for everything he carries, and if he should break a plate or a glass in the load of goods he brings me he has to pay for it."

"But how can you force the Indians to submit to such treatment?"

"They have been used to it for generations and have never known anything else. Besides, we can punish them in various ways. For small offenses we can lock them up in a barn for a couple of days on a water diet. We can also whip them for stealing, provided we are careful not to let the authorities hear of what we are doing, or we can make them come to Cuzco to work as pongoes. Sometimes the Indians are badly treated, and I know of an instance on my own farm where an Indian was hanged to the top of a eucalyptus tree by a rope tied under his arms, and left there for two hours. If the overseer had been found out, he would have gone to jail for two or three years. Justice, however, is more in favour of the master than the servant in this part of the world, and although the laws to protect the Indian are fairly good, he has little chance in the courts if one of the higher classes is the defendant."

"But if the man works five days for you, how is he to take care of his own crops and to watch his cattle and sheep?" I asked.

LANDS OF THE ANDES AND THE DESERT

"That is done by his wife and children," was the reply. "The children learn to herd sheep and cattle almost as soon as they are able to walk, and the women hoe the crops. The men help on Saturday and Sunday. All the Indian women work, wives being selected as much for strength as for beauty. They do their own weaving and make all the clothes for the family.

"On my farm the men do not start working much before eight o'clock. They take things easy, and at ten knock off for a half hour's rest during which they chew coca. They then go back to work until one o'clock, when they take an hour to eat the lunch that they bring with them. At four o'clock they have another rest of a half hour for coca chewing, and shortly after that they stop for the day and go home. By the time it is dark they are asleep."

In further conversation, this man told me something of the Indian villages and how they are governed. He says the estate owner controls the Indians almost entirely through the village officials, who are selected anew each year. Each town has a native *alcalde*, or mayor, who, as a sign of authority, carries a cane as big around as a baseball bat, decorated with silver ornaments. Subordinate to him are two other officers with smaller canes. It is the business of these men to punish offenses, pass upon disputes, and administer justice. In addition, each village has a *mandon*, through whom the proprietor gives his orders, and who is a kind of overseer. This office is greatly coveted by the Indians.

I asked some questions as to education among these people, and was told that sometimes the children attend the public schools in the towns, but that practically none go to school in the remote districts. It is difficult to establish

SLAVES OF ALCOHOL AND COCAINE

a school on an estate far away from the railroad. It has to be done through the minister of public instruction, who has a representative in every province. This requires money, time, trouble, and influence, and the majority of the landholders are not interested. Most of them prefer ignorant and submissive labourers to intelligent and independent ones, saying that it is the educated Indian who causes most of the trouble. One of the *hacendados* told me that he found the men who had been in the army the most difficult to control, and that he wanted his Indians as workers and not as students.

There are many provinces, however, where the Indians work only two or three days a week for the use of their houses and lands, and in some they are also paid a small wage for their labour. In other places they have small farms of their own and raise stock and crops. Where they have come in contact with better conditions, they have often cast off entirely the yoke of centuries of oppression. A few of them are rich, and own mines and estates. In Lima I met a wealthy Indian who has three daughters graduating this year at one of the mission schools. The girls have Indian features but are by no means unattractive. Their father pays five thousand dollars gold a year for the rent of his home in the Peruvian capital, and he owns several automobiles.

In the cities wages have been raised and the lot of the native labourer has been bettered by legislation, the women and children especially benefitting by laws fixing the number of working hours a day. But in the interior, far from railways and outside influences, the lot of the Quichua Indian is little better than it was a hundred years ago.

CHAPTER XXI

ON LAKE TITICACA

TAKE a seat in the airplane of your imagination and point its nose toward the sky. Guide yourself straight upward until you are almost three miles above the level of the sea. Then fly about four thousand miles to the south, crossing the Gulf of Mexico and the Caribbean Sea, and passing high above the peaks of the Andes of Colombia, Ecuador, and Peru. Descend only a few hundred feet, and you are on the shores of Lake Titicaca, which lies between Peru and Bolivia. It is the highest steam-navigated body of water on earth.

You are as far up in the air as the top of Fujiyama, Japan, and about twice as high as Mount Mitchell. You are on the shores of an inland sea about half as large as Lake Erie, and not far from a snow-clad wall of extinct volcanoes. Much of the high plateau that borders the lake is thirteen thousand feet above sea level, and the elevation of the lake itself is more than twelve thousand feet. As I stand here on its shores at Guaqui, Bolivia, I seem to be on the very roof of the world.

Guaqui is at the southern end of Lake Titicaca, not far from where the Desaguadero River flows from Titicaca into Lake Pampa Aullagas, or, as it is usually known, Lake Poopo, about a hundred miles to the southeast. These two lakes drain a large part of the Andean plateau. The region has a plentiful rainfall, but most of the water comes

ON LAKE TITICACA

from the melting snow and glacial ice of the mountains. Lake Poopo is probably drained by subterranean channels, for although it receives more than two hundred thousand cubic feet of water a minute, it has been proved that only two thousand feet flow out of it in that time.

One can get little idea of these lofty bodies of water from the encyclopedias and geographies. They are shown on the maps as oval in shape, and the usual descriptions say that Lake Titicaca is from thirty to sixty miles wide and one hundred and thirty miles long. Some authorities state that it covers thirty-six hundred square miles, while others put the area at more than five thousand square miles. The truth is that the lake has never been carefully surveyed. Its bays and arms are as many as the tentacles of an octopus. The two peninsulas of Huata and Copacabana stretch out from opposite shores and almost meet, dividing the lake into the two sections called by the Indians Titicaca and Winamarca.

On the peninsula of Copacabana is located the shrine of Our Lady of Copacabana. Visitors from all over Peru and Bolivia come here throughout the year, although August 2 and February 2 are considered the most important saints' days. On those dates the pilgrims arrive in a steady procession and include not only the Indians, but a few wealthy whites as well.

Titicaca is so deep that in many parts of it bottom has never been reached. In crossing to Guaqui, I went over places nine hundred feet deep, and I was told that near the Island of the Sun a depth of two thousand feet had been found. When stopping at the island the boats have to tie up to the rocks on shore, for at that point the lake is too deep to use anchors.

LANDS OF THE ANDES AND THE DESERT

I came to Lake Titicaca from Cuzco, riding for two hundred miles over the plain, with mountains towering a mile or more above me. The plateau is so far above the sea that twenty-two Washington Monuments resting one on top of the other would not equal its altitude. The latter part of the trip was over a flat region that once formed a portion of the lake bed, and I crossed many streams that were winding their way down to this inland sea. As I neared Lake Titicaca, the soil became richer, the cultivated patches increased, and the flocks I saw were larger.

Puno, the Peruvian port of the lake, is a town of adobe buildings roofed with galvanized iron and red tile. An American windmill close to the station seemed to wave its arms in welcome to me as I arrived. The train carried me out on the pier to the steamer, on which I embarked for my trip across the lake from Peru to Bolivia. The boats leave Puno twice a week at about seven o'clock in the evening. One steamer calls at points along the shore of the lake, and the other makes a direct run, arriving at Guaqui at nine or ten o'clock the next morning. The four steamers in service are vessels of from nine hundred and fifty to sixteen hundred tons. They have fairly good accommodations for passengers, and my little stateroom was well ventilated and comfortable. The captain and the purser were Peruvians and the sailors Indians.

These lake boats were made in Europe and sent here knocked down, the parts being brought over the railroad from Mollendo to Puno, where they were assembled. The first boat was put into service on Lake Titicaca before the days of the railroad, and was carried up the mountains in pieces on the backs of men and mules.

As we steamed away from the pier and out into the lake,

ON LAKE TITICACA

I stayed on deck to watch the shifting landscape. The skies above Titicaca were extraordinarily beautiful. The clouds rose up from the shores like walls fitting into a vault of heavenly blue, and our ship seemed to be shut off from the rest of the world. The fleecy white masses were blown this way and that by the winds, and the scenes changed every moment. It rained just before sunset, and afterward a mighty rainbow spanned the lake. As I looked, I thought of the vast treasure vaults of the Andes and the gold that may really have been at the two ends of that rainbow. A little later the blazing god of the Incas dropped below the horizon, painting the sky with a hundred tints. The gorgeous colours were reflected in the waters of the lake, and we sailed through a haze of gold, copper, and blue.

When I arose the next morning the air was so clear that I could see for miles. The islands seemed to float upon the water, looking like blue balloons rising from a sheet of silver rather than the half-submerged summits of the highest mountain chain on our hemisphere. One island rose out of the lake like a gigantic mushroom of blue velvet, and another looked like a huge whale with its head and tail high above the water.

The sides of most of the islands in Lake Titicaca are covered with Indian huts and patches of potatoes, quinoa, and barley. In places the hills are terraced to form great steps above the curving shores. On many of the islands are ruins of the old Inca civilization. I saw the Island of the Sun, or as it is now called, Titicaca, where, according to the legend, Manco Ccapac and his sister-wife were set down upon earth. The rock where these two Incas landed as they dropped from the sky was more sacred to the Incas

LANDS OF THE ANDES AND THE DESERT

than Plymouth Rock is to us, and it is still pointed out by the Indians. It is said to have been plated with gold and kept covered with a veil, and the temples about it were decorated with gold. Some authorities say that the name "Titicaca" comes from the Aymara word, "Inticarca," meaning cliff or rock of the sun. On this island, about two hundred feet above the level of the lake, is a large spring known as the "bath of the Incas." Leading from it to the shore is a rough stone stairway along which the water runs in a cascading stream bordered by flowers and a few overhanging trees.

The Indians still look with reverence upon the Island of the Sun. They once thought that a crop grown upon it was blessed by their deity, and the grain raised there was considered so precious that it sanctified and preserved all others. Therefore, it was carried about over the country, and small portions of it were put in the public storehouses. It was said that a man whose granary contained even one kernel of the sacred Titicaca Island grain would never lack for food. The island is now the farm of a wealthy Bolivian.

About six miles from the Island of the Sun is Coati, or the Island of the Moon, which was supposed to have been the wife of the sun. The Incas built there a great convent for the vestal virgins. According to tradition, none could be admitted to it except maidens of royal descent who from their earliest youth had been trained for that service. As the girls reached maturity they were obliged to take an oath of perpetual seclusion. Some of the records say that not even the emperor was admitted to see them, but others allege that they were his secondary wives—in other words, his concubines.



Lying two miles above sea level Lake Titicaca is the highest steam navigated body of water in the world. On two of its islands, sacred to the sun and the moon, the Incas built temples and convents.



The native craft of Titicaca is the balsa made of bundles of reeds. They are practically unsinkable, and when the rushes finally become water-logged, the Indians cut fresh ones and build another boat.

ON LAKE TITICACA

The ruins of the convent show the traces of many rooms surrounding a court. The building was erected high above a series of terraces, the stones in the walls of which were put together without cement. They are as perfectly joined as those in the fortifications of Sacsahuaman or in the temples of Cuzco.

In going back and forth between these islands and the mainland the Indians use boats that are exactly the same as those they had when the Spaniards conquered the country. These boats, called balsas, are made of tall reeds that grow in the lake near the shore. The Indians cut off the reeds with a knife on the end of a long pole, and bind them into rolls or bundles fifteen or twenty feet long. These are then sewed or tied together with strings of long grass and form the sides and bottoms of the boats.

The balsas are shaped like a canoe. They are beautifully curved, and their sides are made so that they extend out at the top to keep the water from splashing in. Many of them are so large that donkeys, llamas, and mules are ferried in them along the shore and even across the lake from one side to the other. The boats are driven by sails also made of reeds, or are pushed through the shallows by poles from ten to twenty feet long. When in deep water and there is no wind stirring, the Indians use the poles as paddles. The balsas are practically unsinkable, which is fortunate for their Indian passengers. Because of the extreme coldness of the waters of the lake, these natives almost never learn to swim.

The balsa reeds have a cellular pith, like the stem of the banana. They are light when dry, but after they have been in use about six months they become water-soaked. The boats are then no longer safe, and are torn to pieces.

LANDS OF THE ANDES AND THE DESERT

The reeds are dried and put into further service as roofing on the Indian huts. They are used also for making ropes and baskets, and are almost as important to the Titicacans as the bamboo is to the Chinese.

Many of the Indians spend almost all their time in their balsas, carrying freight from place to place, or fishing in the waters of the lake. Titicaca has two varieties of fish that are especially good to eat. One swims in great schools and is caught by the Indians in nets. These fish are cured in ovens built of little boulders gathered from the shores of the lake. The stones are heated until red hot and then piled up in alternate layers with the fish. After the fish are thoroughly baked and dried, they are sent to La Paz and other markets, being eaten chiefly by the poorer classes. Fresh fish also are often seen in the markets.

Titicaca has no fish game enough to attract sportsmen. Several years ago a movement was started to stock the lake with trout, whitefish, and salmon from the United States, but it was finally decided that those varieties would not thrive here.

It seems strange to think of fishing and hunting in these bleak regions of the high Andes. Nevertheless, I am told that millions of ducks nest near Titicaca and Poopo, and I know I saw thousands from the deck of my steamer. There were teal, snipe, mud hens, and several other varieties of wild fowl, all so near that I could have shot them with my revolver. One of the chief shooting grounds of the country is at the mouth of the Desaguadero River, and I am told that hunting parties of Americans from La Paz often bring down hundreds of ducks in one trip.

Lake Titicaca is the halfway station on one of the high-

ON LAKE TITICACA

roads of traffic from the Pacific to the capital of Bolivia. On the wharves of Guaqui are piles of Oregon pine lumber, and our lake steamer carried also American-made flour, mining machinery, and rolls of paper for the dailies of La Paz, together with the boiler of a railroad locomotive. The purser of the boat tells me that there is always plenty of cargo for the steamers, and that during his last trip he took one hundred and twenty thousand pounds of tin from Guaqui to Puno. Since the opening of the railway from La Paz to the port of Arica on the Pacific coast, more than half the freight into Bolivia has been carried over that line.

CHAPTER XXII

THE TIBET OF SOUTH AMERICA

I HAVE come to a city that is the highest national capital in the world and the commercial centre of a region that can be compared only to Tibet in Asia. I am almost two and a half miles above the sea, and from my hotel window I can see the perpetual snows of Mount Illimani, which towers about nine thousand feet higher. Although one of the loftiest mountains of this hemisphere, Illimani is not really a peak, but rather a vast mountain mass that is impressive because of its enormous height and bulk. It has four separate peaks, all of which are eternally capped with white, giving this Andean giant its name, which means "Snow Mountain." Among these peaks, at an altitude of almost sixteen thousand feet, is a little lake, and on their slopes glaciers are always slowly creeping downward.

When I first visited La Paz in 1898, I crossed the plains between here and Lake Titicaca on a stage drawn by eight mules. The teams were changed every three hours and we made most of the forty-five-mile ride at a gallop. On this trip I came to the Bolivian capital by rail, boarding the train at Guaqui. That port is a town of mud and galvanized iron buildings. It is scattered over a large area, and looks somewhat like the desert towns I have seen in Arizona and Nevada. I ate my dinner in the Grand Hotel Guaqui, the meal beginning with *chupe*, a

THE TIBET OF SOUTH AMERICA

greasy soup with vegetables and a great chunk of meat floating in it. There was also fish from Lake Titicaca, beefsteak, and a concoction of potatoes that contained so much pepper that my mouth still burns when I think of it.

Leaving Guaqui, I rode in a comfortable train across a region that is bare and bleak in the extreme, although it is almost in the shadow of the great Sorata range, the grandeur of which is beyond description. The trip takes three hours, but at the end of that time I could still see no sign of a city. Suddenly the train stopped at the very brink of a great precipice, and there was La Paz spread out far below me.

The city lies in a mighty hollow in the plateau away up here on the roof of the world. Its site is shaped like a giant letter U, three miles wide and about ten miles long. This natural bowl is supposed to have been a depression in the bed of the great inland sea that once covered the plateau. Then, scientists say, the earth rose and the water ran out at the crack through which the Chuquiyapu or La Paz River now flows, leaving the great basin shut in by its giant ramparts. Cultivated patches now extend far up the sides of the basin, and at the bottom are the two- and three-story houses roofed with red tiles and galvanized iron, the great churches and public buildings, the wide plazas and narrow streets, that make up the city of La Paz.

I have climbed the walls of Jerusalem, and have tramped for miles about the Great Wall of China. They were made by man, and neither is more than fifty feet in height. The walls of La Paz were made by God and are thirty times higher. They extend upward from the city for a distance three times the height of the Washington Monu-

LANDS OF THE ANDES AND THE DESERT

ment, ending in a plateau that is more than thirteen thousand feet above the level of the Pacific Ocean.

From the little station on the edge of the basin I rode down the sides of the walls on an electric trolley, zigzagging this way and that in great winding curves. Here the cars flew around a loop, and there they cut a figure 8, while farther on I could see a half-dozen different levels of track above and below me. As I descended, the city seemed to grow larger, and the houses, which had looked like toys when viewed from above, became of normal size. I could soon distinguish the streets and the buildings about the great central plaza. At the same time I began to notice the people, most of them dressed in the bright hues that transform the thoroughfares of La Paz into a maze of waving ribbons and make the city one of the most colourful in South America.

La Paz was founded by the Spaniards in 1545 on the site of a former Indian village where the natives had been washing gold from the river for many years. It is now the capital of a country that, since even before its national existence, has been again and again in the throes of warfare with outside powers and the scene of internal revolutions. It is only within recent years that the republic has had freedom from disturbances long enough for it to develop its great resources by modern means and to establish railway connection with the outside world.

Bolivia was originally a part of the viceroyalty of Peru, and later was under the rule of the government at Buenos Aires. It owes its national independence in a large measure to the George Washington of South America, Simon Bolivar, for whom it was named when it declared itself a republic. Bolivar was a Venezuelan who, during

THE TIBET OF SOUTH AMERICA

a visit to the United States in 1809, was greatly impressed with our then new government, and returned to South America determined to free his country from Spanish rule. After ten years of alternate victory and defeat on his part his efforts were finally successful, and in 1819 he was made the first president of the new republic of Colombia, which contained the former royal colonies of Venezuela and New Granada.

In 1822 Bolivar was called to help the Peruvians in their fight for independence, and two years afterward was named dictator of Peru. Later the present republic of Bolivia was formed. For a long time Bolivar had absolute control over Colombia, Peru, and Bolivia, and there has never been any proof that he ever used any of the government resources for his private gain, or that he was ever insincere in his work for liberty in South America. However, dissatisfaction with his exercise of power arose, and he was finally forced to resign, dying shortly thereafter.

Bolivia to-day is probably the third largest of the South American republics. As its boundaries have never been exactly determined, estimates of its area range from five hundred thousand to more than seven hundred thousand square miles. It is one fourth as large as the main body of the United States and six times the size of Great Britain and Ireland. The republic extends from north to south as far as from Canada to the Gulf of Mexico, and it is almost as wide as the distance from New York to Detroit. Nevertheless, practically the only part of the country known to the outside world is the plateau, which is important chiefly for its minerals. It is a mighty treasure vault containing vast deposits of tin, silver, copper, tungsten, and bismuth.

LANDS OF THE ANDES AND THE DESERT

As the rugged chain of the Andes comes down into Bolivia from Peru, it divides into two great branches, between which lies this high table-land. Only ninety miles inland from the Pacific, it has an average elevation of more than thirteen thousand feet above the level of that ocean. From north to south it is about four hundred miles long and from east to west a hundred miles wide. The Bolivian plateau is so large that eight states the size of Massachusetts could be laid down upon it without touching the slopes of the mighty peaks that skirt its edges. There are large areas of flat country broken at intervals by smaller ranges. Higher than the Peruvian plateau, this table-land is also colder, and has practically no trees upon it, although much of it is covered with scrubby bushes and grass upon which alpacas and llamas feed. The winds that sweep over it are extremely biting. Indeed, to protect my face from the intense cold I often have to wear a sort of knitted helmet of alpaca wool, covering my whole head except my eyes and mouth.

Bordering the plateau on the east are the mountains of the Cordillera Real, which contain some of the highest peaks in the New World. It is walled in on the west by the Cordillera Occidental, where Sajama, the monarch of that range, and the snow-clad peaks of Pomarapi, Parinacota, and Huallatiri all tower more than twenty thousand feet into the sky. In fact, Bolivia has more high mountains than any other country outside Asia. Within its borders are more than a dozen that approximate four miles in height, to say nothing of this great table-land, twice as far up in the air as the plateaus of the Rockies.

At the edge of the plateau the land slopes steeply downward, and many mountains that are capped by eternal



La Paz is the world's highest capital, and behind it is Illimani, one of the loftiest mountains in all the Andes, 20,800 feet above the sea. The city is the commercial centre of Bolivia, as well as the seat of government.



Sheltered within the walls of a rocky gorge fifteen hundred feet deep, La Paz has succeeded in coaxing a few trees to grow on the Alameda, one of the principal residential streets.

THE TIBET OF SOUTH AMERICA

snows have at their feet all the fruits of the tropics. Travelling on horse- or mule-back, one can descend between daybreak and sunset from a glacial mountain pass fifteen thousand feet high to a land of flourishing orange groves. Indeed, dropping down a mile in this part of the world brings climatic changes equivalent to those of a journey two thousand miles to the north of the Equator or two thousand miles to the south.

On the eastern slopes of the Cordillera Real, not far from La Paz, is a district of fertile valleys known as the Yungas. That region has a semi-tropical climate and a heavy rainfall, and is covered with luxuriant vegetation, including plantations of coca, coffee, corn, sisal, and sugar cane. Most of the cane is used for the manufacture of alcohol. There are groves of English walnuts, as well as of oranges, bananas, peaches, apples, and pears. Practically all the fruit of the La Paz markets comes from the Yungas, being brought in on the backs of Indians or on mules. On some days as many as five thousand mules and burros go over the trail to the capital. A railway is now being built from La Paz over one of the highest mountain passes of the world and thence down into the Yungas. It is one of a network of lines that are planned to connect the plateau with the lowlands and the surrounding republics.

Until recent years, Bolivia has been almost a hermit country. Lying in the middle of the South American continent, it is separated from the Pacific Ocean by the mountains and the coastal desert, and from the Atlantic by the almost unexplored regions east of the plateau. It has no seaport, and until within the last generation it had no railway connections with the rest of the continent.

LANDS OF THE ANDES AND THE DESERT

Even to-day most of its fertile lands on the eastern slope of the Andes are practically unknown.

Considering the extent of its productive area, Bolivia is one of the most thinly settled countries on earth. It has an average of only three or four people to the square mile. Its entire population is less than that of the city of Chicago, and there are not as many whites living here as in Columbus, Ohio. Most of the Bolivians are on the plateau. In fact, eighty per cent. of them live two miles above sea level, and as many as sixty per cent. have their homes at an elevation of twelve thousand feet or higher. The majority of the people are Indians, who work for the whites and the mixed breeds.

Bolivia has no large cities. La Paz has perhaps a hundred thousand inhabitants, and Cochabamba, the next largest town, has only about one third as many, notwithstanding the fact that it is located in one of the most fertile valleys of all South America. It is the chief distributing point for all of eastern Bolivia, and has grown steadily in importance since it has been reached by a railway. Sucre has less than thirty thousand people, and the mining centres of Potosí and Oruro still less.

Although it is a country almost without cities, Bolivia has two capitals. The legal capital is Sucre, about three hundred miles southeast of here, which is the seat of the supreme court and of the archbishopric. It was at Sucre that Bolivian independence from Spain was proclaimed in 1825. The city, which had been founded in 1536 as La Plata, was then renamed in honour of General Sucre, the first president of the republic. Sucre is the Boston of Bolivia. It has more of an atmosphere of culture and education and less of commercialism than the other towns

THE TIBET OF SOUTH AMERICA

of the country. Its lower altitude gives it a pleasant climate and makes it a favourite residence of wealthy retired plantation and mine owners. Even in colonial days many of the rich men of Potosí had their residences here, and many features of the old Spanish architecture are yet to be seen in its homes and public buildings. The city still contains the former legislative and government palaces, and has a university and many churches. The Metropolitan Cathedral is probably the wealthiest in Bolivia, its Virgin of Guadalupe being an image of solid gold adorned with precious jewels, and said to be worth more than a million dollars.

Later, the actual seat of government was changed to La Paz, which is the chief commercial city of the country, and more accessible to the rest of South America. It is here that the president, the national officials, and the foreign diplomats live, where congress meets, and where the real work of the administration is done.

The President is the big man of Bolivia, and is at the head of a government that in form is somewhat like that of the United States. Besides the chief executive and his cabinet, there are judicial and legislative branches, the latter composed of a senate and a chamber of deputies, nominally elected by the people. There are a number of provinces and departments administered by prefects and sub-prefects appointed by the federal government. The capital of each department has its municipal council, and the subdivisions have municipal boards. The territories in the northern part of the republic and in the Gran Chaco, on the border of Paraguay, are governed by delegates.

CHAPTER XXIII

SUNDAY IN LA PAZ

LET us go this morning for a stroll about La Paz, to see how the Bolivians spend the Sabbath. During the week the city has a population of perhaps one hundred thousand. On Sunday this number is increased by thousands of Aymará Indians from the surrounding country. Whole families come en masse, many travelling forty or fifty miles or more. They choose Sunday as their one and only trading day of the week, selling the products they have carried in on their backs, and making all their purchases at that time. A visit to the market will show us the real La Paz better than anything else could do.

We leave our hotel on the plaza in the centre of the city and walk past the police station and down the hill to Market Street. The sidewalks are filled with buyers and sellers, and we pick our way in and out among this mass of humanity for three blocks before we reach a living cross of all the hues of the rainbow. The Plaza San Francisco and the intersecting streets are filled with people moving to and fro, the whole making a kaleidoscopic picture such as can be seen nowhere else on earth.

I have visited most of the great market places of the world. I have haggled over prices in Calcutta, Bombay, and Benares. I have dickered with the Orientals in Cairo and Tunis and with the Slavs at the great fair of Nijni

SUNDAY IN LA PAZ

Novgorod on the Volga. I have seen the open-air markets of Africa and the mighty bazaars of Siam and Burma, but nowhere have I found so much colour and brightness as right here in La Paz. It dazzles the eyes with a dozen different hues to Cairo's one, and the costumes of Calcutta would seem plain and dull beside those we see here.

The Indians are dressed in the gayest of red, yellow, purple, and green. Grown-ups and children have practically the same costume, and even the babies are clad like their parents. The men and boys wear ponchos, embroidered vests, and pantaloons that reach halfway down the calf and are slit up to the knees at the back. A piece of white cotton is sewed inside the trouser legs, so that they may be more easily rolled up when the Indian crosses a stream. Many of the men are barefooted, and some wear leather sandals tied on with strings. Practically all of them have on little felt hats with round crowns, under which are knit caps with earlaps. It is said that the Aymará wears his cap day and night, throughout winter and summer, taking it off only when it falls to pieces. The Indian women wear hats like the men's, and their petticoats rival in gaudiness the ponchos and blankets we see.

While most of the clothing of the Indians is made of wool that has been spun and woven by the women and children, much of the material for making ponchos has come from Germany in recent years. Trade agents from that country make a careful study of the wants of the natives, and the manufactured goods, made with a knowledge of the Aymará's love for bright colours, find a ready market.

What a lot of babies there are all about us! We have

LANDS OF THE ANDES AND THE DESERT

to pick our way carefully to keep from stepping on them. Some lie on the bare cobblestones and play with the merchandise their mothers are selling. Others, too young to crawl, are tied up in shawls on the backs of the women, who go on with their business with apparent disregard of their burdens. There is one peeping out of that red shawl below us. Its face is as brown as a berry and its little black eyes blink at us from under its yellow knitted cap, the earlaps of which stick out like horns on each side of its face. Another baby, a few months older, is being watched by its father, and on the opposite side of the street we see several taking their lunch at their mothers' breasts.

Most of the babies are laughing, and only one or two are crying. Some are pretty, some are ugly, and nearly all are dirty and covered with vermin. We see several whose heads are undergoing an inspection at the hands of the mothers, who eat the product of their search. This condition is not confined to the heads of babies; it is found among both the Indians and the lower class *cholos* of all ages. Men, women, and children take part in both the hunt and the feast, the rule being that the hunter is entitled to all the game that he catches, no matter upon whose preserves he is pursuing the chase. In this connection I might tell how I carried my poor Spanish with me from store to store in search of a fine-toothed comb, but the experience is too recent and too painful to relate.

Mingled with the crowd is a large part of the white population of the Bolivian capital, which has come out to buy and see the sights. We pass women in black with black crêpe shawls wound tightly about their olive-skinned faces. Formerly no Bolivian lady of social standing would think of appearing in the market, but that condition

SUNDAY IN LA PAZ

is changing, and we see many women dressed in Paris models, who have evidently stopped at the markets on their way home from church. Some are accompanied by men who wear high black hats, black clothes, and black gloves.

But let us go on with our walk. How quiet it is! There is the hum of conversation and now and then the jangle of bargaining, but though there are thousands here, we hear scarcely a footfall. The bare feet and the leather sandals of the Indians make hardly a sound as their owners pass over the streets. In addition to the crowd on the cobblestone roadways are two long lines of women merchants sitting on the sidewalks with their vegetables and other products spread out before them. Here is a woman with a little pile of potatoes and two or three artichokes. Close by is another selling onions, and a little farther over a girl has for sale green roasting ears, peas, and lettuce. On the opposite side of the street is a woman who has flour in bags that hold but a half pint, and farther on are peddlers of fruit. As in the markets of Peru, everything is sold by the pile, and the piles are exceedingly small. There are no weights and measures to tell the buyer how much he is getting. A half-dozen little potatoes, a handful of flour, or a tablespoonful of salt are the usual amounts sold, and one person's entire purchases for the day could be crowded into a half peck basket.

Nevertheless, the variety of vegetables and fruits and meats is large, and the quality is especially fine. Bolivia has maize with kernels twice as large as any grown by our farmers. Some, of a bright yellow colour, are as big as my thumb nail. Others are white and so floury that they can be mashed to a powder between two stones. Some

LANDS OF THE ANDES AND THE DESERT

of the corn is a mulberry colour; other kinds are red, or even jet black.

In addition to the red, white, and pink potatoes we have already seen in Peru, Bolivia has a number of other varieties. Some, of a grayish yellow colour, will grow on the highest plateaus. They have an acid taste and must be laid out in the sunshine a while before cooking. Others are shaped like dahlia roots and taste somewhat like turnips. Nearly every potato seller has *chuño* among her wares. It is made in much the same way as that I saw in Peru. Along the Desaguadero River one may see sacks of these potatoes, anchored by long strings to stakes driven into the bank, soaking in the stream before being frozen. The passage of a steamer near one of these submerged sacks is always the signal for an Indian boy to scamper down the bank to stand guard and see that the *chuño* is not washed away by the waves or broken loose by being caught in the paddle wheels of the boat.

Strolling onward we see quinoa, wheat, barley, and oats, all sold in almost infinitesimal quantities. Next are oranges, apricots, and bananas, sweet and sour lemons, and enormous white grapes. There are alligator pears twice the size of those that are sold in our markets, as well as tunas, the fruit of the cactus. One strange variety of fruit, the *chirimoya*, looks like a mammoth bean pod. It has a green skin and a pulp that when cold tastes like finely flavoured ice-cream. One woman is selling coffee beans fresh from the grove, and another is peddling sections of sugar cane half as long as my arm. Most of these products have been brought by the Indians all the way from the Yungas valleys.

Among the Indians are many *cholos*. The women are



It is a forty-mile trip from La Paz to the glaciers of Mount Illimani, though when viewed from the streets of the capital they seem to hang over the city.



Although Bolivia is a land of the tropics, it is so cold on the high plateau that instead of setting up business in a shady spot, the La Paz market woman seeks a place in the blazing sun.



The well situated *chola* cook of La Paz could hardly look the world in the face on Sunday without her complete outfit of bright green skirt, gorgeous fringed silk shawl, round derby-like hat, and white kid boots with high heels.

SUNDAY IN LA PAZ

known as *cholas*, and *cholita* is a semi-affectionate term for a young girl. The *cholo* men dress much as we do, but the women and girls cling to the same costumes of generations ago. They delight in bright colours, and seem to have robbed the gorgeous Andean sunsets for the gay hues of their shawls and dresses. Hundreds of them wear skirts of sea green or sky blue, and not a few have short dresses of flaming red. They have shawls of the finest of silk, so draped that they stand out over the skirts. The skirts reach only to the calf of the leg, the plumpness of which is emphasized by high buttoned shoes of white, cream, or blue kid. This fashionable footgear has high heels and is tied at the top by a cord and tassel.

The girls wear straw hats that the Americans have most appropriately dubbed "white enamelled derbies." These have tiny black bands around the crown and bows on one side. Sometimes the bands seem to be pasted on the hat, and sometimes they are merely streaks of black paint. As the *cholita* struts along the street on her high heels she wears her hat rakishly tilted forward and walks with a swing. She flirts her skirts to show her green or blue stockings, but often she has no stockings at all, and what looks like hose of rose-coloured silk is really an expanse of bare leg.

The *cholas* are very proud of their admixture of white blood. They consider themselves superior to their Indian sisters, and look down upon the woman who wears a blanket or sandals. They are more intelligent than the Indians. Many of them own small stores and saloons and carry on much of the retail business of the Bolivian capital. Not a few are the sole support of their families, their husbands often doing nothing but loaf about the streets of

LANDS OF THE ANDES AND THE DESERT

La Paz, spending the pin money allowed them by their wives.

Leaving the market and strolling onward, we are jostled by donkey and llama trains, and by Indians as well. Much of the freight of Bolivia is carried on the backs of the natives. When I arrived here my trunks were taken from the depot by Indian *cargadores*, or porters, who charged me about fifty cents each for carrying two hundred pounds a distance of more than a mile.

I saw an odd load yesterday. It was a limp bundle about five and a half feet long and perhaps eighteen inches wide, rolled up in a blanket and thrown over a mule so that the ends hung down on each side of the animal's back. Beside it on another mule rode a policeman, while a crowd of Indian women came wailing behind. The bundle was the body of a woman who had been murdered a few days before for the fifty dollars that she was known to have saved, and the policeman was bringing the corpse and the criminals to La Paz.

Here comes a drove of llamas down a side street. Their heads are in the air, and their ears stand up like those of a fox terrier. They look this way and that, and seem surprised at the strange things about them. Every animal is marked or branded in a way that seems partly for identification and partly for ornamentation. Some are splotched with red paint, others have notches or holes cut into their ears, and many have their ears tied with gay ribbons and strings. Each llama has a bag of freight tied on its back with ropes that pass under its belly. They are loaded with *taquia*, or dried llama manure, which by nightfall will be distributed among the kitchens of the city as fuel.

Practically all the cooking of La Paz is done with this fuel.

SUNDAY IN LA PAZ

Most of the coal used in the city has to be shipped in from other countries. Coal is known to exist on the Copacabana peninsula in Lake Titicaca, along the route of the railway to Arica, and in other parts of the country, but none of the Bolivian deposits has been developed to any extent. Near La Paz, peat beds that cover twenty-five hundred acres are being worked on a small scale.

The freight rates on coal are so high that it is too expensive for ordinary use, and the result is that there is not a furnace or hot-water heating plant in the whole city. Several of the wealthy families use electricity for heating purposes, and by paying an extra charge I can have an electric heater in my hotel room until ten o'clock at night.

During the winter months of June, July, and August the temperature in La Paz often varies fifty or sixty degrees during twenty-four hours, and although one may be comfortable at noonday in the bright sunshine, after night-fall many of the houses are decidedly chilly. The first stove ever used in La Paz was brought here about thirty years ago by the American minister to Bolivia, and was at first regarded with awe and superstition by the Indians. Even most of the whites at that time considered artificial heat injurious, putting it in a class with moonlight, which was to be avoided by all means. A journey begun on a moonlight night was certain to end in misfortune, while not even the most infatuated suitor, it is said, would think of serenading his chosen one beneath a full moon. The moonlight, he firmly believed, would bring on neuralgia if it struck his face, and would cause baldness if his uncovered head were exposed to it.

Llama manure is burned in small stoves, giving forth but little smoke and no sparks, and can be safely used

LANDS OF THE ANDES AND THE DESERT

by even the most stupid Indian. La Paz seldom has fires that do any great damage, and, indeed, I am told that only a few buildings have been burned down within the past fifty years. Most of the structures are built of mud bricks, with trimmings of stone, and it would be difficult to set them on fire. Thatched roofs have been forbidden by a city fire protection ordinance.

I can see great changes in La Paz since my last visit here. The capital has sprung into new life, and it seems to me more enterprising than Lima, although the latter is almost twice as large. New buildings are going up, and masons and carpenters are working everywhere.

The streets are full of traffic. When I was here before there was not a public cab in the whole city, and you could number the private carriages on your fingers and toes. Now there are taxis and innumerable private automobiles. There is also an electric car line that extends for about two miles down the valley to the suburb of Obrajes. The streets are so narrow that the cars often have to run at one side, and the trolley wire is attached to the walls of the houses.

La Paz is a city of hills and valleys. The thoroughfares parallel with the river are more or less level, but the cross streets climb up and down, and the altitude is so great that one unaccustomed to it can walk but a very few steps without stopping to get his breath. Fat people especially are most uncomfortable, and are wise to avoid exertion as much as possible. I have been told here that cats cannot stand the rarity of the atmosphere of La Paz, as they go into convulsions and die. I was ready to accept this statement as true, particularly as I could not remember ever having seen a cat here—or of having my midnight



Taking a walk in La Paz means more than at home, for climbing the steep streets in the thin air of twelve thousand feet altitude may cause the stranger to suffer palpitation of the heart, headache, or nausea.



High up above the Bolivian capital is the chief cemetery of the city. It consists of a series of wall-like structures, divided into rows and tiers of niches, in which the coffins are placed.

SUNDAY IN LA PAZ

slumbers disturbed by feline yowlings. When I mentioned this fact one day to an American who has lived in Bolivia for several years, he agreed that La Paz was seemingly catless, but attributed the condition, not to the atmosphere, but to the natives' taste for stewed cat as a table delicacy.

The use of automobiles in La Paz has brought a demand for better highways, and the rough cobbles of the more level streets have been covered with crushed stone. On the steep thoroughfares, however, the cobblestones afford a foothold for the llamas and donkeys, as well as for the human beasts of burden we see.

Within the past two decades La Paz has practically doubled in size. It has spread out to the edge of its basin and has begun to extend down the valley. In the centre of the city is the beautiful Plaza Murillo, filled with shrubs, flowers, and trees. It was named for the Bolivian patriot who was executed there by the Spaniards in 1810. On one side of this plaza is the Capitol, and on another side is the executive mansion, where I called upon the President. It is a handsome building, beautifully finished inside. I went up a staircase of the purest white marble from the quarries of the Desaguadero River, and the magnificent parlour in which I was received was decorated with statues and paintings.

Next to the President's palace is the unfinished La Paz cathedral, which is planned to seat twelve thousand people. It has been in the course of construction since the foundations were laid in 1843, parts of it having been torn down and rebuilt again and again. Skilled craftsmen were brought from Europe to instruct the Indian workmen in cutting and polishing the stone used in the building, the

LANDS OF THE ANDES AND THE DESERT

natives proving surprisingly apt pupils. The altar is to be of native marble from the quarries not far from La Paz. The cathedral is being put up by funds obtained from a tax upon all the goods brought across Lake Titicaca, which is to be in force as long as the work of building goes on. There are some unkind skeptics who allege that the cathedral will never be completed, as the contractors are desirous of continuing the receipts from these imports.

Although some of the older stores of La Paz are not unlike those I saw in Cuzco, there are large business buildings that would be a credit to any city of the same size in the United States. Many of the stores that formerly were mere caves in the walls have put in plate-glass windows, and are displaying modern merchandise. As the plateau is chiefly a mining region and manufacturing is but little developed, most of the necessities of life must be imported, and consequently prices are high. I saw athletic goods for sale, and learned that there are golf links on the heights above La Paz. There are several tennis courts in the city, and the first baseball game in Bolivia was played here on July 4, 1920, between two teams recruited from the American colony.

Homes of modern type are beginning to make their appearance in La Paz, and bathrooms and up-to-date plumbing are no longer the rarity they were a few years ago. On the outskirts of the city are many fine residences, some of them of the French villa and Swiss chalet type. They are of two stories with very high ceilings, and are made of brick covered with bright-coloured stucco. Other residences are of Spanish architecture, surrounding patios in which are fountains and trees and beautiful flowers. Such buildings are found in the heart of the city, and from

SUNDAY IN LA PAZ

the streets the passer-by can look in through the front doors and catch a glimpse of the gardens within. In some houses the patios are used as storehouses and stables for the donkeys and the llamas that bring in the crops from the country estates of their owners. Many of the business buildings were once residences, and their patios are now filled with packing boxes.

One thing that adds to the brightness of the Bolivian capital is a law that requires every man to paint his house front at least once a year. The annual painting season was not long ago, and just now everything is spick and span with gay colours. Another city provision is that every one must each day sweep the streets in front of his house.

CHAPTER XXIV

THE FIRST CITY IN AMERICA

ON THE high plateau of Bolivia, not far from La Paz, are the remains of a prehistoric city that scientists say is probably the oldest in all America. It antedates Machu-Picchu in Peru by thousands of years, its origin having been long forgotten when the Inca Empire was founded. The time of its building has never been exactly fixed, but the pottery, relics of gold and copper, and the skeletons of human beings taken from its ruins lead to the supposition that it was in existence two thousand years or more before the first stones of the pyramids were laid down in Egypt.

This ancient city is known as Tiahuanaco, and the ruins are only a half mile from the Indian village of that name. They are twelve miles from Lake Titicaca, but the remains of stone piers indicate that when the city was built it was directly on the shores of the lake. Most authorities say the ruins are those of a mighty city, but others claim that Tiahuanaco was merely a place of worship and a sanctuary. It is true that at its present elevation this region is too cold and bleak to support a large population. That fact has led to the general belief that in the far-distant ages when Tiahuanaco was built this part of the plateau had a much lower altitude and consequently a warmer climate.

I stopped at Tiahuanaco on my way across the plateau from Guaqui to La Paz. As at most of these plateau



At the time of the Spanish conquest the Incas had forgotten, if they ever knew, the origin of the buildings at Tiahuanaco, believed to be the oldest ruins in the Americas, and more ancient than the pyramids in Egypt.



For centuries the ruins at Tiahuanaco have served as quarries, five hundred trainloads of cut stone having been used for railroad bridges alone. Here an Indian has put together an ancient doorway and built his mud hut around it.

THE FIRST CITY IN AMERICA

towns, I was besieged at the station by Indians and *cholas* selling eggs, meat, and food, as well as by a horde of children and grown-ups offering me souvenirs. Knowing that visitors to Tiahuanaco are interested in the ruins chiefly because of their great age, the natives try to sell tourists ordinary pebbles and bits of stone—in fact, any kind of article they can find—blandly stating that they are “antiques” thousands of years old.

The village consists of mud huts, many with doorways of beautifully carved stone that has been brought from the ruins and set into the walls. On some of the thatched roofs are wooden crosses which, with the Indians, have taken the place of the sun god symbol. The town has a Catholic church built partly of beautifully cut stones taken from the ruins of the ancient city. In front of it is a cross on a pedestal made of such stones, and on each side of the gateway that leads into the church are carved idols. These also came from old Tiahuanaco, whose people worshipped we know not what.

The ruins are scattered over a broad level plain, with an area equal to about a dozen one-hundred-and-sixty-acre farms. There is nothing to be seen on any side except the mud huts of the Indians and the alpacas, llamas, and sheep shepherded by Aymara women who spin or knit as they watch their flocks. Between the fallen pillars and blocks of stone a few scrawny pigs run grunting and squealing. In the distance towers the high wall of the Andes.

Most of the ruins of Tiahuanaco have been carried away. Only the mighty pillars scattered here and there, the carved stones from the old buildings, and the remains of massive walls and terraced mounds indicate the wonders

LANDS OF THE ANDES AND THE DESERT

of the past. Some stones are half buried, and others rise above the tufts of grass and the scanty shrubbery. Traces can be seen of five great structures, which scientists know as the fortress, the temple, the palace, the hall of justice, and the sanctuary. The temple was a rectangle 455 feet long and 388 feet wide. Its outlines are marked by massive blocks of red sandstone, some of which are still erect. They evidently formed part of a rough wall that supported a platform of earth rising eight feet above the surrounding plain. On the eastern side of this platform was a lower terrace along the edge of which were ten great stone pilasters ranging from nine to fourteen feet in height and from two to four feet wide. Nine of them are still standing to-day. The fortress, which also was built in terraces, was even larger than the temple, measuring 620 feet long, 450 feet wide, and 50 feet high.

One of the most striking of the ruins is a great doorway eighteen inches thick, seven feet high, and thirteen feet long, cut out of trachyte, a light-coloured volcanic rock. The opening through its centre is four and a half feet high and almost three feet in width. Above it the stone is covered with beautiful carvings that remind me of those I have seen in the ancient temples of Egypt. Some of the figures hold sceptres and some have crowns on their heads. They have human bodies, feet, and hands, but often the heads of condors. The central one, in especially high relief, is supposed to have represented Pachacamac, believed by some of the Indians to have been the creator of the universe. This doorway has been broken across the top, either by earthquake or lightning. Visitors to Tiahuanaco during the middle of the last century say that it was lying on the ground, but later it was found to be

THE FIRST CITY IN AMERICA

standing upright again, although there is no record of who raised it. Another doorway, not so large, has been carried away from the ruins to a cemetery halfway between here and the village.

There are many other enormous stone blocks larger than any I have seen elsewhere in the world outside Cuzco or Egypt. I saw one thirty-six feet long and seven feet wide, and another twenty-six feet long, sixteen feet wide, and six feet thick. Some of the blocks are sandstone and others trachyte, the latter beautifully carved and polished. How they were transported here in the dim prehistoric ages when Tiahuanaco was built probably will always be a matter of conjecture, as to-day rocks of this size are found only at long distances from here.

Among the most remarkable features of the ruins are the stone idols that have been dug out of the ground and stood upright. Some of these idols are of gigantic size. Their bodies are so large around that I cannot encircle them with my two arms, and they are more than eight feet in height. The faces have thick lips, and the heads are so cut that they would be a delight to our modern Cubists. They are all angles, even to the eyes, the noses, and the lips. Their features are now sadly mutilated, however, due in great part to the idols being used as rifle targets by Bolivian youths passing through here.

Many of the excavations at Tiahuanaco were made known to the outside world by Ephraim George Squier, who came to Peru more than a half century ago as a special commissioner from the United States and described these ruins in his book, "Incidents of Travel in the Land of the Incas." When I was first in Bolivia, more than twenty-five years ago, I went over Squier's discoveries

LANDS OF THE ANDES AND THE DESERT

with Professor Adolph Bandelier, who was then here for the American Museum of Natural History, and who said that Squier's deductions as to the age of this city were in the main correct. Squier was told by the Indians that there were large vaults beneath the temple, and that an underground passage led from here to Cuzco. He dug under the foundations but found neither vaults nor passage. More recently, further discoveries were made by Dr. Otto Buchtein, the director of the National Museum at La Paz. He unearthed many interesting ruins not far from the temple, and others elsewhere on the plain.

I have visited the National Museum at La Paz, which now contains many of the objects found at Tiahuanaco. Some of the smaller idols have been taken there, as well as several other stone figures and numerous pieces of pottery. The director of the museum believes that the pottery dates back to eight thousand years ago, or to more than six thousand years before Christ. If he is correct, these are the oldest records of civilization now in existence. He tells me that he does not think that Tiahuanaco was a city of the red race, but of a white race that inhabited this part of the Andes in prehistoric times. In this idea he is not alone.

Others have expressed the belief that the Bolivian plateau was once inhabited by the ancient Phœnicians, and that the gold of Ophir came from the Andes. The Bible states that the ships were three years in making the journey to the mines. In those ancient times it would certainly have taken as much as three years for a ship to pass out of the Mediterranean through the Strait of Gibraltar, cross the Atlantic Ocean to the west coast of this continent by way of the Strait of Magellan, and then return.

THE FIRST CITY IN AMERICA

The verse referred to says they "brought back gold and also almug trees, and ivory, apes, and peacocks." There is no ivory in South America and the peacock comes from India. There are plenty of monkeys in the lowlands of this continent, but as to the almug tree, I know it not.

The collection of pottery numbers thousands of pieces and fills several rooms. The objects are of all sizes, from vases that will hold three or four gallons to little cups not as large as an eggshell. There are bowls and beautifully shaped terra-cotta cups. Many of the latter are as fine as porcelain and when tapped give forth a similar sound.

Some of the pottery resembles the Etruscan in its decoration, while other pieces are covered with hieroglyphics somewhat like Chinese or Japanese characters. The cups and the bowls shaped like a cat seem to indicate an Egyptian origin. They made me think of Bubastis, where the people worshipped the cat in the days of the Pharaohs. That ancient city was situated in the Land of Goshen, not far from the present site of Zagazig, and on the main route from the Holy Land to Egypt. Bubastis had many cat goddesses, the greatest of which was a cat-headed woman. It had a cemetery filled with the mummies of cats, many of which had been incased in coverings of wood or bronze. Among the cat-shaped pots of Tiahuanaco were found skeletons of llamas and vases shaped like the head of the condor, the great vulture-like eagle of the Andes.

The excavations at Tiahuanaco have also yielded up many implements of stone, gold, copper, and bronze, spoons of terra-cotta, knives of bone, and arrow points of obsidian, a black, glossy, volcanic rock. Bone rings and needles of various kinds have been found, as well as stone pipes drilled out of a rock as hard as quartz. How the

LANDS OF THE ANDES AND THE DESERT

people were able to drill the holes without steel or other metal is unknown. All these things were found within ten feet of the surface of the earth. The soil above them was sand, indicating that the city of Tiahuanaco was for a long time covered with water, which probably accounts for the remarkable state of preservation of the relics.

Much of the pottery was found near human skeletons and seemed to have been buried with the dead. There were two pots beside the skull of a man or woman, and one beside that of a child. On the foreheads of the skulls of the women were plates of pure gold as thin as paper. Each plate bears the image of a man, indicating, perhaps, that the weaker sex worshipped the stronger eight thousand years ago, regardless of how man's acknowledged superiority has since dwindled. The features of the image are beautifully marked and look as though the gold leaf had been pressed upon a die.

Although the Aymará Indians about Tiahuanaco are supposed to be descended from a race much older than the Incas, their skulls are not like those found in the excavations. The skulls I saw in the museum are different from any known to anthropologists. Of enormous size, they indicate a race of giants. The foreheads slope back from the eyes, reminding one of the Flathead Indians of North America, the jawbones are heavy, and the teeth are still almost perfect, though perhaps eighty centuries old.

The Aymarás have many stories and legends as to their origin. One is that the first people on earth became so wicked that the gods turned them into the stone idols of Tiahuanaco. According to another Aymará tradition, the world was created by the great god Pachacamac, who made it beautiful to look upon and filled it with comforts. It

THE FIRST CITY IN AMERICA

was ruled, however, by Khunu, who brought droughts and cold and pestilences, until man could hardly exist and became little more than a beast. Then Pachacamac fought the evil Khunu. He sent rains to make the deserts bloom, and brought forth the sun to warm the earth. But Khunu was not yet vanquished. He added to the rains until a flood occurred, during which the earth was in darkness.

After that, according to the legend, the prayers of the people were answered by Inti, the sun god, who rose from his shrine in Lake Titicaca to flood the earth with warmth and light. Another god, Ticcihuiracocha, aided him by smoothing down the mountains, filling up the valleys with fertile soil, and causing waters to flow from the rocks and irrigate the land. Above all, he instilled in the hearts and minds of the people the qualities of piety, order, and industry. Realizing that gold and silver were the cause of greed and corruption, he hid them in the depths of the most inaccessible regions or in lofty mountains. It was under this god that man was given a fresh start and eventually achieved his present civilization.

These Indians of Tiahuanaco hold on feast days a sort of war dance that rivals the ruins as an attraction for most tourists. The men wear costumes of coloured cloth and much bright tinsel, with headdresses of brilliant feathers made in great fan shapes. Marching through the town performing a sort of snake dance, they are accompanied by a bedlam of noise produced by the violent beating of drums and the playing of native flutes. The celebration usually ends in a drunken carousal in which *chicha* and alcohol flow freely. Similar carnivals, I am told, are held at La Paz.

LANDS OF THE ANDES AND THE DESERT

Another exhibit of much interest in the La Paz museum is a large collection of mummies, discovered near the Arica-La Paz railway when that line was being built. They are supposed to be the mummies of the Chulpas, who lived before the time of the Incas. Each is enclosed in a basket or bag of fibre, with the head of the mummy protruding from an opening in one end. The material out of which the bag is made is like pineapple fibre, and notwithstanding its great age it is firm and strong. The threads are evenly twisted, and each bag is woven to the exact size and shape of the mummy within.

The Chulpas were buried in a sitting posture, the legs so doubled up that the knees were tucked under the chin and the arms clasped back of the neck. I saw scores of these mummies, and was allowed to carry some of them outside to be photographed. One was that of a young woman. It was at least fifteen hundred years old, but the bones were sound and the teeth were as white as snow and in far better condition than my own. I carried her out of the darkness and put her down gently in the sunlight on the steps beside me. As I did so, there came to my mind the soliloquy of the hero in Tennyson's "Vision of Sin," as he dances the tango with his skeleton partner:

You are bones, and what of that?
Every face, however full,
Padded round with flesh and fat,
Is but modelled on a skull.

No, I cannot praise the fire
In your eye—nor yet your lip;
All the more do I admire
Joints of cunning workmanship.



Fifteen-hundred-year-old mummies have been found on the Bolivian plateau. They are supposed to be the remains of Chulpa Indians, among whom the dead were buried in a sitting posture, encased in sacks.



The Indians say that the first people on earth became so wicked that the gods turned them into stone figures, some of which are still standing at Tiahuanaco. Their modern use as targets in rifle practice has not improved their looks.

CHAPTER XXV

THE AYMARÁ INDIANS

IN COMING to northern Bolivia from Peru, I have left the land of the Quichua Indians for that of the Aymarás, who live about Lake Titicaca in the northern part of the Bolivian plateau. They comprise the chief Indian race of this republic, although the Quichuas are found again in the southern part of the country. The Aymarás are said to have been so powerful that they were never subjugated by the Incas as were the other Indian nations that inhabited the western part of South America. Even after centuries under the white man's rule they are to-day more aggressive and independent than the humble and submissive Quichuas. They are also larger in stature than the Peruvian Indians, most of them having an extraordinary chest development that enables them to breathe without difficulty in this rarefied atmosphere.

After the Spanish conquest the Aymarás were practically enslaved, and many of them on the plateau are still in a state of peonage. The Indian of Bolivia is so attached to his bit of land that it has always been almost impossible to make him leave when large tracts have been formed into great estates. Rather than seek a home elsewhere, he prefers to work for the white owner a certain number of days a week in return for the right to stay on. He receives no pay except the privilege of occupying a hut and cultivating a small piece of ground. Indeed, the Aymarás cares

LANDS OF THE ANDES AND THE DESERT

nothing for his country, his government, his wife or children, and little for his own comfort, but he is genuinely attached to his bit of land and his llamas or sheep. Unless his animals are commandeered by his employer or the government, he refuses to sell them at any price, although he will practically sell his children as servants.

An Englishwoman who has been living here for years says that a system of child slavery still exists in both Peru and Bolivia. Indeed, this woman tells me that she herself has bought boys and girls under twelve years of age. At times she has given them a home out of pity and at other times because she wished to use them as servants. The system is similar to the custom of binding out children to work for their board and clothes that was once common in some parts of the United States.

When particularly in need of money, Indian parents offer to sell a child as a servant for from five to ten dollars in gold. A contract is then made in which the parents are given the right to take the child back upon repayment of this sum, but as it is practically an impossibility for the Indian to obtain enough money to do so, the purchase of the child usually means that one has its services until it grows up. The law provides that it must be well treated and taught to read and write.

Practically all the domestic labour of La Paz and other cities of Bolivia is done by the Aymarás. The lowest types are the pongoes, who carry burdens, bring the vegetables and meats from the market, and clean the pots and pans. All kinds of drudgery falls to their lot, including much work that servants of other classes refuse to do. Indeed, though the rich man may afford twenty other servants, he must still have his pongo.

THE AYMARÁ INDIANS

Notwithstanding his hard life, the Indian servant is attached to his master and will work for him for little or nothing rather than for a foreigner who will pay good wages. The Aymarás make their masters grievances their own, and are ready to fight for them on any occasion. Feuds are often carried on between the Indians of neighbouring farms, who engage in pitched battles with guns or with slings, the ancient weapon of the Aymarás. Fights over land are common even among the small property owners. It is not unusual for one man to remove another's boundary marks and then drive in his sheep to graze. This usually precipitates a bloody battle, all the friends of each man being brought in as reinforcements.

These Indians do not like strangers, and I found them particularly averse to having me photograph them or their homes. These huts are usually in villages, but some of them stand alone on the plateau and high up on the mountain slopes. The houses and the home life of the Aymarás are much like those of the Quichuas. Often the cooking is done outside, and sometimes an oven is built against the wall with a cover to protect it from the wind and the snow. As in Peru, the women and children may be seen spinning wool as they watch their flocks or drive their llamas along the trails. Even the bags for grain and potatoes are usually of homespun.

A favourite dish of the Aymarás is a stew of dried mutton called *chalonga*. To make *chalonga*, the carcass of the sheep is sprinkled with water at night and left out of doors to freeze, the process being repeated several times. It is then hung up to dry, and soon becomes so tough and hard that it will keep for months. When used it is cut into bits and boiled a long time, often with vegetables and *chuño*.

LANDS OF THE ANDES AND THE DESERT

About the same habits of drinking and coca chewing prevail among the Aymarás as among the Quichuas. However, it is said that these Indians are more intelligent than those of Peru, and that the average mentality rises as one goes on southward. When his mind has not been deadened by alcohol or cocaine, the Aymará is like the Japanese in his aptitude for learning new things. It is not uncommon to find boys and girls who are equal to the whites in quickness and mental alertness, and it is known that many of the prominent men of La Paz have a strain of Aymará blood.

There is no doubt about the natural mechanical ability of the Aymará. He is painter, carpenter, and mason in La Paz. All the labour on the fine houses and public buildings of the city has been done by him, and he often exhibits considerable artistic ability in making exterior decorations of mica mixed with lime and sand and then burned in such a way that it has a finish like that of the best plaster of Paris. The Indians make much of the furniture used in La Paz and do a great deal of interior woodwork in mahogany, rosewood, and black walnut. They also operate the machinery in many of the factories and mines of Bolivia. They seem to be industrious, and their employers say that they are as good workers as the *cholos* or whites.

Many of the best labourers and mechanics of the country are Indians who, while serving in the army, acquired such a taste for civilization that they have come to the cities to work. When their military service is over, most of them are not content to go back to the semi-savage life of their villages. Those who do go carry with them the seeds of civilization, which soon sprout into a crop of new ideas and customs.



The bulk of the people on the northern part of the Bolivian plateau are Aymarás, somewhat superior to the Quichuas of Peru. They do the hard work of the country, and many of them become skilled artisans.



The Indians work cheerfully enough for the land owners, but insist on frequent stops for rest, talk, and coca chewing. Though they have a reputation for sourness and sullenness, a white man is absolutely safe alone among them.

THE AYMARÁ INDIANS

The reorganization of the Bolivian army several years ago made military service compulsory for every youth between the ages of nineteen and twenty-one. As the army is not large enough to take in every man, however, lots are drawn annually to see who will serve. Thousands of Indians from every part of the republic are brought to the military barracks and schools, where they are drilled by German officers. They make fine-looking soldiers and are said to have good fighting qualities, being particularly noted for their great powers of endurance. In addition to being taught to obey, they learn to read and write and to do simple sums. Soldiers are always on guard at the President's palace and the capitol, and I frequently see them marching through the streets of La Paz. They serve on the local police force, which is a good one.

An institution that is doing much toward the civilization of Bolivia's Indians is the industrial mission school that has been founded on the shores of Lake Titicaca. The school is supported by funds donated by an Italian, one Antonio Chuiotto, who became an ardent Christian while in Los Angeles. As a young man he had left Italy and settled in California, where he made money in the milling industry and then emigrated to Argentina. There he became interested in bettering the condition of the Indians of South America, and when he knew he had not much longer to live he decided to leave his money to the Argentinians for that purpose. However, the laws of that republic presented certain legal difficulties in the accomplishment of this purpose, and he thereupon came to Bolivia to carry out his scheme.

Chuiotto's estate, consisting of about thirty-five thousand dollars, was used to purchase five hundred acres of

LANDS OF THE ANDES AND THE DESERT

level land on the shores of Lake Titicaca, about forty-five miles from La Paz. There were about two hundred and fifty Indians living on it, who, according to custom, went with the property. They were allowed to retain the little patches of ground that their ancestors cultivated from generation to generation, and given the use of pasture for their flocks of sheep and llamas. In return, they work for the mission about two days of each week.

The manager of the farm says that at first the Indians would have nothing to do with the missionaries. They had been told that they would be worked to death and cheated out of all their property. However, once they learned to trust the Americans, a great desire for education sprang up among them and a school was established and is attended by both children and grown-ups. The children have to work for their parents most of the day, and so their school hours are from seven to nine in the morning, but they are so anxious to learn that they usually are on hand before the teachers are awake.

New plants and grasses have been introduced at the farm, and experiments are being made with grains to see if better crops cannot be raised on the plateau. The trustees expect to improve the breeds of sheep and to bring in goats and American cattle. The manager says he had great difficulty at first in persuading the Aymarás to try anything new, particularly the modern American plough. They were shown that our ploughs could go twice as deep as theirs, but they were not entirely converted until they saw that the land ploughed in the new way raised better crops than ever before.

The manager tells me that many of these Indians still believe in witchcraft and that although they are sup-

THE AYMARÁ INDIANS

posedly Christians, they reverence spirits and the manifestations of the forces of nature. During a drought they worship streams and springs, and in cold weather they pray to the stars and the moon that their crops may not be ruined by frost. They think that death is caused by a spell cast over the deceased. When a man dies his relatives and friends are anxious that the witches shall not continue to pursue his soul. Not long ago, the family of a man who had just died came to the overseer of the school farm and asked him to make a cross on a piece of paper and below that to write: "I have died because I am bewitched by my enemies, and I here pray to the Lord that I may be free from them in the future." This paper was put into the hands of the dead man and buried with him.

Another United States school in Bolivia that has accomplished much for the Indians is the American Institute at La Paz. It is supported largely by the Methodist Episcopal Church, but the Bolivian government considers it of such benefit that it makes an annual appropriation for it and encourages it in every possible way. The school was founded by Methodist missionaries in 1907 at the request of the Bolivian government, and is non-sectarian in its teaching. When it was first opened it had one hundred and twenty boys in attendance, and since then the number has grown to three hundred or more. The buildings of the Institute are crowded, and there are more applicants than can be admitted. The boys are of all classes, from the sons of wealthy farmers and miners to those of Indian burden bearers. They may enter the school at any age and stay through the equivalent of a high-school course. Many of the graduates become clerks and private secretaries, and others continue their studies in

LANDS OF THE ANDES AND THE DESERT

the colleges of law or medicine in one of the Bolivian universities. The students come from all parts of Bolivia and even from Chile and Peru. Not a few of them have to travel a month by mule, stage coach, and train to reach La Paz.

During my stay here I have visited this institute and talked with its teachers, who are graduates of the best universities and colleges in the United States. It is modelled after our boys' boarding schools, and has all the features that make school life pleasant. To some extent it has taken the part of a Young Men's Christian Association in the encouragement of games and the development of athletics. It has a literary society, school publications, and a Boy Scout organization that puts on football matches and track meets. I have before me the programme, printed in Spanish, of a recent tournament. The contestants were in three classes, the first of which was for former pupils and students about fifteen years of age. The second class included boys between eleven and fifteen years, and a third class was for boys under eleven. At the end of the meet prizes of gold, silver, and bronze medals were presented by the United States Minister to Bolivia.

The Methodist Church has established also a secondary school at Cochabamba, in the heart of Bolivia, about three hundred miles from La Paz. That school receives the same support from the government as the one at La Paz.

The elementary public schools of Bolivia are managed chiefly by the municipalities. Attendance in them is nominally compulsory, but they have almost no Indian pupils. Last year these schools numbered only about five hundred, with not more than sixty thousand students. The republic has about forty schools for higher education,



Some notable experiments are being made in providing schools for the Indian children of the Bolivian highlands. The Methodists of the United States have been especially successful, and their work is now supported in part by the government.



The Aymarás have preserved their ancient dances, compared with which the ceremonials of the Indians of our Southwest are said to be tame affairs. On these occasions they wear elaborate headdresses and false faces.



Comparatively few Indians possess any land of their own. Most of them are tenants or labourers on some large estate, the value of which is estimated largely by the number of Indian families living on it.

THE AYMARÁ INDIANS

including high schools for girls at La Paz, Sucre, Santa Cruz, and Trinidad; there are universities at Sucre and La Paz, and schools of mines at Oruro and Potosí. La Paz has a commercial school with classes for men and women, and also schools of engineering, mining, and agriculture.

In the past Bolivia has relied almost entirely on minerals as the source of its wealth. Now the development of agriculture is receiving more and more attention from the government, and in 1922 a law was passed prohibiting the opening of a public school where there is not enough ground for a school garden. This law provides for an agricultural course in the normal schools that prepare teachers to work among the Indians. The State also gives a certain amount each year for the support of the educational programme of the Catholic Church, which has missions throughout eastern Bolivia.

CHAPTER XXVI

FROM LA PAZ TO ORURO

I HAVE come from La Paz to Oruro, the centre of the greatest tin-producing region in all the Americas. To reach it I rode for eight hours across the bare, stony plateau on the La Paz-Antofagasta railway. We passed many Indian villages, and now and then saw scattered homes here and there on the plain. About Lake Titicaca, the huts of the natives were rectangular in shape, but these were round and many of them had mud instead of thatched roofs. Each farm settlement contained several such homes, surrounded by corrals for the cattle.

At one station I noticed hundreds of llamas, which had come in loaded with bundles of a kind of evergreen shrub that is used for fuel on the plateau. The bushes are grubbed out from the mountainsides and carried to the stations on the backs of men and women as well as on llamas.

Among the picturesque crowds around the stations at two or three of these plateau villages I caught glimpses of the Callahuaya, or travelling witch doctors of the Andes. A member of this profession is recognized at a glance by his distinctive costume, which consists of black breeches, a red and white poncho, a bright-coloured sash, and a broad sombrero hat. On his breast he wears a huge silver cross, and slung across one shoulder is a wallet containing aromatic gums, barks, herbs, charms, and figures like the small stone llamas I saw at Cuzco.

FROM LA PAZ TO ORURO

The Callahuaya travel in groups, often staying away from home for as long as five years. They go from place to place, stopping awhile in each town, where they serve as a combination of witch doctor, veterinary, lawyer, and general counsellor for all who seek their advice. During these ramblings the women are always left at home. Indeed, it is not unusual for a man about to be gone for a long time to insure his wife a home by bestowing her upon a bachelor friend. It is also customary for the husband, upon his return, to adopt any children born to his wife during his absence.

Farther on I rode for miles through a flooded region, where heavy rains that had fallen the night before had covered the pampa with water. In some places it looked like a great lake; in others the waters had subsided, leaving a sort of alluvial deposit. Parts of the plateau were dry and with almost no vegetation. Other parts were alkaline, and the white sands almost blinded my eyes. The mountains are farther away than on the Peruvian plateau, and although the altitude is almost two and one half miles, one does not seem to be at such a great elevation.

Except for the massive snow-covered top of Illimani, which was within plain sight as I left La Paz, the country as seen from the car windows was bleak and monotonous. Later, I had also a fine view of the extinct volcano of Sajama. An Indian legend says that that mountain was once the summit of the flat-topped Mount Chacaltaya, and that it was knocked off by a stone from the sling of a giant and hurled to its present location. The "stone," the legend says, still exists as a hillock on the plain near the town of Viacha, which we reached about an hour after leaving the Alto above La Paz.

LANDS OF THE ANDES AND THE DESERT

Oruro derives its name from the Uru-Uru Indians, who lived on the shores of Titicaca when that lake covered the entire region between here and its present shores. It lies on the plateau at an altitude of more than twelve thousand feet, and as a whole is windy, dusty, and unattractive. The streets are filled with sand blown about by the sharp winds that sweep over the plateau, and the few trees and shrubs are stunted and dry. Rising behind the city is a background of desert hills honeycombed with mine openings.

Many of the houses of Oruro are one-story adobe buildings, but it has some good stores and hotels, and there are a movie theatre and clubs established by the foreign population. The city now has about twenty thousand inhabitants, but is said to have had four times as many in colonial days when silver mining was at its height in the hills about the town. Silver is still mined here, but the chief mineral product of the region is tin.

I came to Oruro in a comfortable train, in company with English, Australian, and American commercial travellers, wealthy Bolivians, and miners and tourists from the United States. The trip was far different from the one I made over the same route years ago. That was long before the railway was built, and I rode for three days behind mule teams that went at a gallop all the way. A stage then ran twice a week from La Paz to Oruro. The coaches, which were the most dilapidated rattletraps that ever ran upon wheels, had six seats inside and one on top with the driver. It was the place on the driver's seat that I coveted, but I found at the stage office that it was already reserved and that the whole inside had been taken by a rich Bolivian and his family. All the space in the next

FROM LA PAZ TO ORURO

stage, three days later, was also sold out, and for a time it seemed that I should have to go on muleback or hire a private conveyance, which would have cost one hundred and fifty dollars.

At that moment a friend, adviser, and guide in ways Bolivian advised me to try to get a seat on the mail coach. I learned that there was always room for one passenger on it, and that this seat had not been taken, so I lost no time in handing out the twenty dollars for my fare.

All baggage had to be ready by noon of the day before we started. It took three Indians to carry mine to the station, and La Paz gazed in wonder as the men trotted through the streets with their loads. At the stage office a second dilemma arose. Only two hundred pounds of luggage were allowed. If a passenger had more it was supposed to follow him on the next stage, although the chances were that it would be forgotten for weeks. My trunks tipped the beam of the American scales on which they were weighed at just three hundred and seventy pounds, and it took much persuasion, monetary as well as verbal, before the officials consented to let me take the entire amount with me. At last I was told that it could be done, and was handed a bill for extra charges that amounted to a sum greater than my fare.

I am not more than ordinarily conceited, but I must confess that I felt rather proud that not only myself but my baggage as well were to be carried over the country with the Bolivian government mails. I had visions of a gorgeous red Concord vehicle with uniformed postmen, and it was with conscious pride that I told my friends at La Paz how I was going to travel. I noticed that some of them smiled, and that others looked at me more in pity

LANDS OF THE ANDES AND THE DESERT

than in admiration. At the time I attributed this to jealousy, envy, or ignorance. Soon enough I thought differently.

I had my first sight of the mail coach at six o'clock on the morning of my departure. It was a mere baggage wagon, and the only seat on it was the one with the driver. The bed of the vehicle was so far up in the air that I could almost walk under it without stooping. The wagon box was not more than six inches deep, and I could not see how a ton and a half of mail and trunks could be put into it. I had my baggage hurried out, and it went in at the bottom. The other pieces were piled on top until the wagon looked more like a load of hay coming to the barn in harvest time than the government mail. A rawhide rope was bound round and round the whole, which was then covered with canvas to protect it from a possible rain-storm.

By this time the mules were in their places and I was told to climb to my seat beside the driver. It was at least seven or eight feet above the ground, and without a sign of a cushion of any kind. I finally improvised some with my blankets, and was not uncomfortable. My chief grievance was the lack of cover when it rained and snowed, as it did several times during the trip. My only protection then was my waterproof and my knitted hood.

The "liveried" coachmen of my imagination were *cholos*. They had no consideration whatever for the mules, and their treatment of them was so cruel that I several times protested, useless though it was. In the first place, the harness was twisted until there was not a tug that was straight and not a collar that fitted. As a result the necks of the animals were raw and sore, and this condition be-

FROM LA PAZ TO ORURO

came worse as we went on the gallop over the road. I remember one little yellow mule that, even before he was put into harness, had lost two patches of skin, each as big as the palm of my hand, from the front of his shoulders. I objected to taking him, as there were other and better mules in the corral, but he was hitched up, nevertheless, and was given one of the hardest places in the team. This was next to the wagon and directly under the driver.

We started off at a gallop, but the little beast soon slackened his pace. Then the torture began. The driver cut at him with a whip that drew blood everywhere it touched. We had not gone five miles before the mule's back was bleeding in a half-dozen different spots, and I could see that his collar was red with blood from the raw places on his neck. From time to time I noticed that the driver, when he found that his whipping and whistling failed to hurry the mules, took a heavy tug with an iron chain and ring at one end and rattled it. This rarely failed to frighten the animals into increased speed, but if they did not respond, the driver swung it about his head and brought it down with a terrible thud upon the little mule's back. We changed animals every fifteen or twenty miles, and there was hardly a team that was not scarred and bloody in a short time.

During the trip I had plenty of opportunity to learn what the country hotels of Bolivia were like in those days. The stations where we stopped to eat and sleep were more like stables than inns. None of the rooms had windows, and the floors were of mud or stone. In some, the beds were ledges of sun-dried bricks upon which a mattress had been laid. The only light I had was the candle I brought with me, and my candle holder was a spot of melted grease

LANDS OF THE ANDES AND THE DESERT

that I dropped on the table or a chair before setting the candle down. There were always several beds in a room, and I had natives for room mates every night. Before I retired the hotel keeper would come in and collect a dollar for the use of the bed and a dollar for dinner.

We started at five every morning, and at half-past four I was up and ready for a cup of tea, which, with a couple of biscuits, comprised the breakfast served in such places. Lunch, which was our real breakfast, was eaten at eleven or twelve o'clock, and was more like a dinner. It began with a vegetable soup and was followed by two or three stewed dishes, all of which fairly swam in grease. Dinner was much the same.

Such were the accommodations on one of the most travelled roads of the country. Conditions of the mule trails were far worse. Prospectors when off the beaten tracks frequently were unable to procure food or shelter of any kind. This condition exists even to-day in parts of interior Bolivia, as many of the Indians will not allow strangers to come into their huts if they can possibly prevent it. Money seems to be no inducement to them, and the only way to get a night's shelter in such cases is to go in and take possession of the best part of the hut. If there is anything at hand that is eatable, take it and give the Indian some money for it. If you ask to buy it he will refuse, and even if he has plenty he will say he has nothing. The chances are that next morning, when you pay him for your night's lodging, he will not be displeased, but he will offer you nothing and will sell as little as he can.

Twenty-five years ago there were almost no good roads in Bolivia. The highways through the mountains were nothing but mule trails, often cut along the sides of preci-



The town of Oruro is the centre of a mining district that produces a large portion of the tin supply of the world, ranking second only to Malaya. The Bolivian ore leads the world in its high percentage of pure metal.



The natural plumpness of the *chola* becomes corpulency when she wears twenty or more skirts. Besides upholding the family prestige in dress, the *chola* is usually its business manager also, and often the owner of a market stall or beer shop.

FROM LA PAZ TO ORURO

pices so that one rode within an inch or so of destruction. Indeed, the road over which I travelled was then the best one in Bolivia. The dried-up basin of the great inland sea that once covered the plateau formed a natural road-bed. In some places it was as flat as a floor for miles, and in others there was a gradual slope, but not enough to impede the galloping of the mules. We went through long stretches of land where there were great piles of stones scattered over the fields, and in several places I saw Indian women going along picking up stones and carrying them in the front of their skirts. They are used also to make walls between the fields, and there are so many of them that the walls and the piles usually cover as much ground as the cleared area.

The La Paz-Oruro road was one of the few routes on which freight was transported by wagon. On most trails it was carried on the Andean beasts of burden or on the backs of men and women. We met no other vehicles on the road, although we passed droves of animals loaded with all kinds of freight. There were scores of donkeys carrying bundles of coca leaves on their backs to supply the towns farther south. Llamas loaded with silver ore stalked proudly along with cocked ears, and there were many trains of mules. Each train was managed by one or two Indians, who walked with or behind the animals, never riding them so far as I could see. All the prospectors used mules for travelling over the country, and all supplies for the mines had to be carried through the mountains in that way. Before the railways were built, mining machinery to be used in Bolivia had to be made in sections, no piece of which could be larger or heavier than a mule could carry on its back.

CHAPTER XXVII

THE GREAT TIN MINES

THE mighty treasure vaults of the Bolivian plateau are now furnishing more than one fourth of all the tin used on earth, and some day will undoubtedly lead the world in the production of that metal. Although practically no attention was given to Bolivia's tin until about a generation ago, its production already ranks next to that of Malaya, whence comes forty per cent. of the world's supply. The output of Bolivia is greater than that of Australia, of Cornwall in England, or of the little East Indian islands of Banka and Billiton, which are the other important sources of tin. Moreover, no other tin mines produce ore containing as high a percentage of metal as those of Bolivia. Five-hundred-pound pieces of ore found here often contain seventy per cent. of pure tin, and one block that weighed a ton contained more than twelve hundred pounds of tin.

Tin is found almost everywhere in the mountains of Bolivia, from La Paz to the Argentine border. It is mined on the high slopes about Lake Titicaca, and in the Cordillera Real and its numerous spurs. It was dug out of the earth by the Indians before the Spanish conquest, but mining by modern methods did not begin until 1895. The ore is found at high altitudes, and one company has its operating offices fourteen thousand five hundred feet above sea level.

THE GREAT TIN MINES

Here at Oruro are tin mines out of which the metal has been taken for generations. One of them is approached by a tunnel that starts near the heart of the city, and I walked less than a half mile before I came to its workings. The ore lies in veins between layers of rock like the meat of a mighty stone sandwich, and no one yet knows how deep into the earth this metallic filling extends. After it is blasted out and carried to the surface, Indian women break the great chunks of rock into small pieces, and sort out the ones that contain tin. The ore looks like that of silver or lead, and is so dull in colour that it is hard to realize that the tin in it may one day be glittering on a new dishpan or wash boiler.

I stopped to watch the women as they sat on the ground breaking up the ore with heavy steel hammers. Their grimy feet and calves were bare under their voluminous skirts, and all of them were dirty and frowsy beyond description. Nearly all were chewing coca. They work from daylight to dark for less than a dollar of United States money. As they are paid according to the amount of ore they break and sort, it was with difficulty that I persuaded them to stop long enough to be photographed.

I learned that the mining company that owns this mountain of minerals employs several hundred women and an even larger number of men. The wages are low, but until 1922, when there was a strike for higher pay, the mine owners had never had to contend with labour troubles.

When I visited the Oruro mines twenty-five years ago, I found them using llama manure as fuel. Quantities of it were brought in from all over the country, four tons being required to run a forty-horse-power engine twenty-four hours. This company has now installed the most modern

LANDS OF THE ANDES AND THE DESERT

machinery, and burns both oil and anthracite coal under its boilers, although some of the mines far from the railways still use for fuel llama manure, dried shrubs, or the peat-like moss that grows on the plateau.

In the past the ore was mined in the most wasteful manner. Only that containing from forty to fifty per cent. of tin was processed; the lower grades were rejected because, with the methods then used, they did not yield enough metal to pay for the labour necessary to treat them. Now, with modern machinery and improved processes, much of this discarded ore is being worked over at a profit.

After the ore is broken and sorted, it is sent to the reduction works, which remove many of the impurities, turning it into what are called tin concentrates. In that form it is packed into bags for export to the smelters of England, Germany, and the United States. Because of the high price of coal, there are almost no smelters in Bolivia. I am told that a small one is operating at Potosí, using charcoal as fuel. In 1920 an American electrical company began a survey of the country to determine how much water-power could be made available for mining properties.

Before the opening of the Panama Canal, Bolivia sent most of its tin ore through the Strait of Magellan to England, where it was smelted and refined. Now practically all the ore goes through the Canal and, though Great Britain is still the largest buyer of Bolivian tin, much of it is sent directly to the smelters of New Jersey and Long Island. The tin exports are increasing every year, the amount shipped in 1922 having been almost double that of 1921. United States investments in Bolivian tin mines have grown steadily, and in 1924 a new mining company,



Because of the excessive cost of coal in Bolivia, tin ore is only partially reduced before it is shipped in sacks to the smelters and refineries of England, Germany, and the United States.



For centuries the mining methods in Bolivia were both crude and wasteful, and only the richest of the ores were saved. This shows the primitive method of crushing the rock by grinding it under a stone.



On the line of the Antofagasta-Bolivia railroad, over which silver and tin ores are carried down the mountains to the sea, are famous borax lakes from which come a large part of the commercial product.

THE GREAT TIN MINES

composed mostly of American stockholders, was incorporated with a capital of fifteen million dollars. More American mining machinery was sold in Bolivia in 1923 than in any preceding year.

There are scores of valuable tin mines in the region about Oruro, and many of them are large producers. The Salvadora, near Uncia, which is one of the largest American-owned properties in the Republic, often furnishes twenty-five per cent. of Bolivia's total tin exports. The Llallagua, which is owned also by American capitalists, is located in the same mountain as the Salvadora and rivals it in production. It has reduction works with a capacity of six hundred tons of concentrates a day. Much of its output is sent to the United States.

The Salvadora formerly belonged to Simon I. Patiño, the "tin king" of Bolivia, who not many years ago was working for wages of a few dollars a month. He is said to have Indian blood in his veins, and no one supposed he would ever be more than a common labourer. When he became possessed of the idea that the tin content of the silver ore could be profitably extracted, his employers had no faith whatsoever in such a project. He went ahead, however, and secured options on many of the old ore dumps and on several mines. In some way he managed to obtain a small capital and, with the few Indians he could hire at low wages, started to work one of the old mines. After a hard struggle, he finally struck a rich vein and almost overnight jumped from poverty to extravagant riches.

Patiño became a multimillionaire, and took a large part in promoting other projects for the development of his country. He bought haciendas and mines in different sections of the republic, and built a railroad from Macha-

LANDS OF THE ANDES AND THE DESERT

camarca on the Antofagasta line to Uncia, sixty-four miles away. He equipped his mines with the most modern machinery, including gravity cableways for carrying the ore to the reduction works. He spends most of his time in Paris, leaving his properties in the hands of his manager.

I have heard of other romances of fortunes made from the tin of these Bolivian highlands. A German mechanic named Kemp, who opened a mine when tin was selling for eleven hundred dollars a ton, sold the property to a Chilean syndicate, which paid him one hundred thousand dollars in cash and an equal amount in shares in the mine. Kemp knew little of the value of money, and he supposed that what he had would last him for ever. He went off to Europe, where he spent right and left, and within less than two years his fortune was gone. He then came back to Chile, expecting to get another hundred thousand dollars by the sale of his stock.

In the meantime, the price of tin had fallen, and the shares that Kemp owned were worth only sixteen cents each instead of five dollars. Thinking he had been tricked, he threatened the operating company with a suit in the courts. The officials replied that there was then no money in mining and that he could have the property back as a gift. He took it, and for a time almost starved. He did not realize enough profit even to pay his Indian labourers. Then the price of tin rose, he organized a new company, and his stock was soon worth more than one hundred and twenty-five thousand dollars.

Another mine near Oruro, the San José, was discovered by a Scotchman named Andrew Penny, who came out here years ago as a mechanic. He afterward married an

THE GREAT TIN MINES

Indian girl, with whom he was living when his mine began to produce tin in paying quantities. The output continued to increase, and Penny became wealthy, but did not live long to enjoy his riches. He died shortly after he had invested some of his money in an estate in Scotland. By the Bolivian law, his property in this country was inherited by his wife and his adopted son, who was a half-breed. The Indian widow, however, was not satisfied, and decided to go to Scotland and see if she could not obtain possession of the estate there. The courts ruled against her and she returned to Bolivia without the property, but with a second husband, who was none other than her Scotch lawyer. He had not been able to win her case for her, but he did win the lady herself—including her millions.

New tin mines that may some day rival the Salvadora and Llallagua mines were opened up not long ago in the Quimsa Cruz range between La Paz and Oruro. Unlike those of other parts of Bolivia, these deposits contain no silver, and so received no attention when tin mining was begun on a large scale in the old silver mines. Six of these mines were acquired by the Guggenheim interests. They are located at altitudes ranging from sixteen to eighteen thousand feet above the sea.

The Guggenheims have built an automobile road from Eucalyptus on the La Paz-Oruro line down into a valley sixty miles to the eastward. The terminus of the road is in an almost tropical region, which has become a popular resort for the mining officials and their families. At the same time, its fruits and vegetables can be quickly transported to the mining camps two miles higher in the air.

Prospecting for tin is going on in many parts of Bolivia,

LANDS OF THE ANDES AND THE DESERT

and the new railroads now building will open up highly mineralized territories that will increase the production of that metal. Although most of the tin ore now mined here is in the form of quartz, prospectors have discovered in one of the rivers deposits of stream tin in nuggets and lumps that range from the size of an egg to that of my two fists or larger. These deposits are said to contain fifty-three per cent. of oxide of tin.

About two hundred and thirty miles southeast of Oruro is Potosí, which for hundreds of years was famous as the greatest silver-mining centre of South America and one of the chief sources of that metal in the whole world. First worked about fifty years after Columbus discovered the New World, during Spanish rule the mines of Potosí produced more than three thousand million dollars' worth of silver, and it is estimated that their total output up to the present time has been worth four thousand millions. For nearly three hundred years their average yield was at the rate of a million dollars' worth of silver a month.

When New York was still but a village, Potosí was a city of one hundred and fifty thousand people, with countless palaces and churches built by the Spaniards. Many of them are standing to-day, the churches and monasteries especially being rich in relics and carvings. Here was established also the first coinage mint in South America. The machinery in it was made entirely of wood, most of which was carried from the Argentine on the backs of Indians. On the hills above Potosí were thirty-two artificial lakes, which supplied water for the mines and the city. One of the lakes was three miles in circumference and thirty feet deep.



For one hundred years, when silver mining was at its height, Potosí was one of the largest cities in the Western Hemisphere, and Spaniards grown wealthy from the great mines built fine houses, some of which still stand.



The great peak back of Potosí is honeycombed with mine workings, said to number more than seven thousand. In the four hundred years since mining began here, the mountain has produced more silver than any other equal area in the world.

THE GREAT TIN MINES

Potosí is one of the highest cities in Bolivia, lying on the plateau at an altitude of 13,612 feet. Behind it, rising two thousand feet higher, is a great conical peak, the Cerro, which has produced more silver than any other area of its size in the world. That mountain is said to have thousands of abandoned silver mines scattered over it, and its sides are still honeycombed with productive workings, although silver has dropped from the high place it once held in the wealth of this country.

The decline in Bolivian silver mining was due to the exhaustion of the more readily accessible veins, the lack of operating capital, and the development of rich mines in other parts of the world, with the consequent fall in the price of the metal. In recent years the industry has revived somewhat. Many of the old tailings have been worked at a profit, but practically all the silver now mined is a by-product of tin.

In Cerro de Pasco, the silver and the gold mixed with the copper practically pay the operating expenses, and the value of the copper is almost clear gain. This same condition exists in connection with the tin mining at Potosí, which is paid for by the silver. The deposits have always shown great values in tin, which formerly, through the miners' ignorance, was separated from the silver and washed away in the streams.

Other old and famous silver mines are those of Huanchaca, which were worked by the natives even before the Spaniards came. More than nine million pounds of pure silver have been taken from them, and the mileage of their underground workings is said to be greater than that of any other silver mine in the world.

Bolivia is known to the outside world chiefly for its

LANDS OF THE ANDES AND THE DESERT

tin and silver, but it is also an important source of copper. Except for the Lake Superior region in the United States, it is the only country where this metal is found in the earth in a pure form. Sometimes copper occurs here mixed with sandstone; it is found also in huge masses called *charquis*, and in great sheets or plates covering many square feet. I saw one such plate as large as the top of an ordinary dining table.

The copper-producing area centres in Corocoro, a town of fifteen thousand inhabitants, mostly Indians, situated in a group of low hills six miles from the main line of the railway from La Paz to the port of Arica. A spur has been built out to that railway, over which the copper is taken to Arica for export to the United States and Great Britain. The chief mining company now operating is an Anglo-French corporation whose mines produce about eight thousand tons of pure copper a year. A Chilean company has an output about one third as large.

As to gold, Bolivia produced more than two thousand million dollars' worth of that metal between 1540 and 1750, but it is now mined only in small quantities, amounting in all to less than a half million dollars' worth a year. It has been found in the sands near La Paz since the Inca reign, and many years ago a nugget as large as the palm of my hand was picked up in that region. Near the same spot another nugget, weighing thirty-three pounds and worth nine thousand dollars, was found in the days of the Spaniards. The Chuquiaquillo mine near La Paz produced one hundred and twenty-five million dollars' worth of gold in the eighteenth century.

For centuries the Indians have been washing gold from the headwaters of the Beni, and the gravel of that stream

THE GREAT TIN MINES

shows colour all the way down to the Amazon, into which it flows. It is believed that a great part of the gold of the Incas came from there. Some gold is being found in the River Quisere, which flows over a bed of quartz upon which is an alluvial deposit containing gold that can be recovered by dredges. English and American miners have long been prospecting in eastern Bolivia. They have found that many of the rivers contain gold, but, because of their swift currents and underlying beds of slate and granite, can be worked only with modern machinery. Until better means of transportation are provided, there is no practical way to take mining and ore-reducing machinery into the interior.

Another great store of mineral wealth in Bolivia is its petroleum. The oil oozes out of the ground in many places in the eastern part of the country, and for generations has been used by the Indians for lighting and heating. In recent years a number of companies have been formed for its exploitation. Concessions have been granted to Americans to develop some of the oil deposits, and in 1921 the Standard Oil Company purchased outright a tract of eight million acres. The centre of production at present is near Santa Cruz, although wells are being drilled as far south as the Argentine border. The national petroleum law provides that the government shall receive a royalty of eleven per cent. of all the oil produced.

The chief difficulty will be in getting the oil to a market. The distance across country to the Atlantic seaboard in a straight line is considerably more than a thousand miles, and sending the oil by that route would necessitate pumping it over the high plateau of Brazil. If a pipe-line

LANDS OF THE ANDES AND THE DESERT

should be run from the lower end of the field down to Asunción in Paraguay, and thence through the Paraná Valley to Buenos Aires, the distance would be almost twice as great, but the slope would be gradual and uninterrupted all the way to the sea. Such a pipe-line would pass through Argentina, where the oil would command a ready market for both fuel and lighting.

Bolivia now controls the world market for bismuth, a metal that is used principally in medicines and cosmetics. A single company, which has its headquarters in Geneva, Switzerland, controls the entire output. During the World War Bolivia was also the world's chief source of tungsten, the metal that has taken the place of carbon for making the filaments of electric light bulbs.

For a long time the mining laws of Bolivia were such that a prospector could not protect his claims and establish clear titles to them. Shyster lawyers and others made a practice of laying claim to every mine supposed to be of value and of contesting its title as soon as it was registered. During a former visit to Bolivia a mining expert said to me:

"I might go to the heart of the backwoods in the eastern part of this country and stake out a mine a hundred miles from where any white man has ever been before, yet I venture that within two days after that mine was a matter of record there would be a half-dozen applications filed, disputing my title and swearing that the contestant had proof that he owned it. This is particularly true of any mine that is supposed to be a good prospect, although titles are often contested after the mine has been profitably worked for a long time."

Such conditions have now been almost entirely remedied,

THE GREAT TIN MINES

and since the World War the mining industry in Bolivia has been on a sound basis and has grown steadily. The use of modern machinery is increasing, new areas are being prospected, and the mining companies are doing their utmost to provide their staffs and miners with living conditions as pleasant as are possible on the high plateau. The greater part of the mineral wealth of the republic is thought to be still under the ground, awaiting better means of transportation and sufficient foreign capital for its development.

CHAPTER XXVIII

DOWNSPOUTS OF THE PLATEAU

BOLIVIA is one of the most shut-in and inaccessible countries of the world. Like the neighbouring republic of Paraguay, it has no seacoast, but while Paraguay has the navigable Paraná and Paraguay rivers, the Bolivian plateau, which contains the mineral wealth of the country, has no rivers whatever that flow into either ocean. Moreover, only twenty-five years ago its capital city had no railway connection with the surrounding countries. There were not three hundred miles of track in the entire republic when I made my first trip here, and to-day the total mileage is only fourteen hundred miles, or less than enough to reach from New York to Omaha.

During the past several weeks I have been travelling over the routes of the three railways that, like mighty ladders, climb from the Pacific Ocean to the lofty Bolivian plateau. The most northerly of these gigantic ladders is the Southern Railway of Peru, which brought me from Mollendo to Lake Titicaca, and thence to the Bolivian capital. That line, which is nearly as long as the distance from New York to Cleveland, for a long time furnished the most important route into Bolivia. Its gradual climb up the Andes, the variety of scenery, and the trip it offers across Lake Titicaca continue to make it the one most favoured by travellers.

DOWNSPOUTS OF THE PLATEAU

As a freight route the Mollendo line has been superseded by Bolivia's other two outlets to the Pacific. One of them is from the Chilean port of Arica, the terminus of the newest, shortest, and steepest railroad from the coast to La Paz. The other is the Bolivian and Antofagasta Railway, which climbs up the mountains from Antofagasta, and then winds its way northward along the plateau to the Bolivian capital.

This republic is still at the beginning of its railroad development, a fact that is not surprising when one considers the formation of the country. The lines on the plateau were comparatively easy to construct, but every route down to the sea has had to cross mountain passes thirteen or fourteen thousand feet high. Labour is scarce on the plateau, and the altitude is so great that workers brought in from other countries cannot stand the thinness of the air. On the western slopes of the mountains much of the road-bed was practically cut out of the rock. In the lower regions east of the plateau the heavy rainfall causes innumerable washouts and slides, necessitating expensive reinforcing along every stretch of track. One authority says that the railways already built here have cost an average of fifty thousand dollars a mile.

The beginning of modern railroad development in Bolivia followed the transfer to Brazil of the Acre Territory near the head-waters of the Amazon. In return, the Bolivian government was paid ten million dollars, with which it decided to build railways. Later, other money was borrowed to continue the work of construction.

In the meantime the development of the airplane has furnished a new means of transportation in this land

LANDS OF THE ANDES AND THE DESERT

of vast mountain ranges and few railroads and highways. A school of aviation has been established in La Paz, and Bolivia in the not far distant future will no doubt have a system of air routes similar to that of Colombia. In 1920 an American aviator employed as a government flying instructor flew over Illimani at an elevation of more than twenty-five thousand feet. The Bolivian army officer accompanying him fainted from the effects of the high altitude.

Perhaps the most important railway of the republic is the Antofagasta and Bolivian. That line is about seven hundred miles long, and the trip over it takes forty-three hours. There are two trains a week each way, equipped with sleepers and dining cars. From Antofagasta, the chief port of northern Chile, one goes over the nitrate fields and across the Chilean desert to the Bolivian frontier. During the first two hundred and twenty-three miles the train reaches an altitude of thirteen thousand feet. It drops about eight hundred feet to a great borax lake, and then begins to climb over the mountains to the Bolivian plateau. Oruro is reached the next morning, and La Paz about eight hours later.

The Antofagasta road is one of the famous scenic routes of the world, and geologically and geographically it is one of the most interesting. Parts of the plateau, which was the bed of the great inland sea that once covered this region, are as flat as a floor. The road goes for miles over stretches of sand, and I am told that sea shells and traces of fossilized fish have been found here. Part of the route is past volcanoes and mountains of lava of the most unusual formations. The road is also important commercially, being the great down-the-mountain chute for



Bolivia suffers from lack of means of communication. Building of both railroads and highways proceeds slowly in the mountain regions, and transport by pack animals has become far more expensive than formerly.



While the best trains from Bolivia to the Pacific coast are equipped with dining cars, the bulk of the native passengers depend on the outdoor refreshment stands at the stations en route.



The ancient Indians of the Andean plateau built only with stone, chiefly because they had practically no wood. Their descendants today use primitive tools and methods in cutting and shaping timber.

DOWNSPOUTS OF THE PLATEAU

most of the tin and silver ore of the Bolivian plateau, as well as for the nitrate, the borax, and the copper of Chile.

The first section of the La Paz-Antofagasta line, which was also the first railway in Bolivia, was the narrow-gauge road built from the town of Uyuni to the coast as an outlet for the Huanchaca silver mines. It was opened to traffic in 1889, and three years later was extended north to Oruro. After that, its construction remained practically at a standstill for twenty years. When the Acre Territory was conceded to Brazil, plans were made for the extension of the road. New York bankers undertook its completion to the capital, as well as the construction of several branch lines. That was in 1906, and seven years later the extension to La Paz was opened to traffic. In the meantime, the controlling interest of the road had been sold to an English company.

In 1917 a branch line was completed from Oruro one hundred and twenty-five miles eastward to Cochabamba, the chief distributing point for the rich agricultural regions of eastern Bolivia. It crosses the divide of Cuesta Colorada and descends into the lower altitude by a series of switchbacks over one of the most beautiful scenic routes on the continent. Surveys have already been made for the purpose of extending that line three hundred miles farther to Santa Cruz. Eventually it will undoubtedly be built eastward another four hundred miles to Puerto Suarez, from where steamers go down the Paraguay River to the Atlantic.

Another branch of the Antofagasta and Bolivia Railway has been built from the main line to the silver and tin mining town of Potosí. The station of Condor on that spur ranks with Ticlio on the Peruvian Central as one of

LANDS OF THE ANDES AND THE DESERT

the highest points on this continent reached by railway. An extension of that line to Sucre, the old capital, is now under way, and its completion will undoubtedly lead to the reopening of many abandoned colonial mines along the route. In the meantime, freight and passengers are carried by automobile between Sucre and the end of the line.

Probably the most important railway under construction is that extending southward from Uyuni on the La Paz-Antofagasta line and northward from Villazon on the Argentine frontier. When the two sectors are united, Bolivia will have completed her share of the proposed Pan-American route from New York to Buenos Aires. The only countries that have already finished their allotments toward that great line of the future are Chile, Uruguay, and Argentina. The latter country now has railway service from Buenos Aires to La Quiaca, which is just across the border from Villazon. On the Bolivian branch there is a gap of only fifty miles or so, over which freight and passengers are now carried by motor truck from May to November, and by mule stage the remainder of the year.

The completion of this sector of the Pan-American will give through railway connection between La Paz and Buenos Aires, and will open a back door, as it were, for the commerce of Bolivia. It will form the last link in South America's second transcontinental railroad, the other Atlantic-to-Pacific route now in operation being the Transandine Railway from Santiago to Buenos Aires. That line is so far south that traffic is often snowbound in winter. The Bolivian-Argentine route will be near enough to the Equator to be free from heavy snows. It will offer

DOWNSPOUTS OF THE PLATEAU

a shorter journey to the Argentine for travellers from Peru and Ecuador, and will make the cattle, the wheat, and the dairy products of Argentina and Uruguay quickly available on the high plateau. Buenos Aires will then be only three and a half days from La Paz. It will be four hundred and fifty miles nearer New York by way of that railway and the Panama Canal than it is now by the all-water Atlantic route.

While the project for railway connection with the Atlantic was still in its earliest stages, Bolivia acquired another outlet to the Pacific. This was the La Paz-Arica line, which was built by Chile as an outcome of the long controversy over the ownership of the strip of coast land formerly controlled by Bolivia.

Bolivia originally owned the Chilean province of Antofagasta between its present boundary and the sea. In that province, which is rich in nitrate, is not only the city of the same name, but three other important ports as well. In 1866, and again in 1874, arrangements were made between Bolivia and Chile for the joint possession of the nitrate fields, but their control continued to be a subject of dispute between the two countries. In 1879, with Chile's seizure of the port of Antofagasta and her declaration of war against Bolivia and her ally, Peru, hostilities were begun.

The Treaty of Ancón, which ended the fighting, was signed in 1883. By its terms, Chile took possession of the Peruvian province of Tarapacá, while the provinces of Tacna and Arica, farther north, were to be occupied by Chile for ten years, at the end of which time a plebiscite was to be taken to determine their ownership. That plebiscite was postponed from time to time for various

LANDS OF THE ANDES AND THE DESERT

reasons, and when Chile finally agreed to hold it Peru maintained that Tacna and Arica had been under Chilean influence and government too many years for such a method of deciding the issue to be still fair. No settlement agreeable to both countries could be arrived at, and it remained for the United States, in 1922, to make an effort to bring Peru and Chile to an amicable agreement. Our government invited the two republics to send representatives to Washington for a conference, at the completion of which, if necessary, the President of the United States will act as arbiter.

In the meantime, although Chile had obtained possession of Tacna-Arica and Tarapacá, those provinces were cut off from the rest of the republic by Antofagasta, still claimed by Bolivia. Bolivia's possession of her one remaining strip of seacoast did not last long, however, and the year after the Treaty of Ancón saw that province under the provisional control of Chile. In 1901 Bolivia relinquished all claims to Antofagasta, in return for which Chile agreed to build a railway from Arica to La Paz, and to turn over the Bolivian section to this country at the end of fifteen years.

The line was opened to traffic in 1913 under the control of the Chilean State Railways. Well-equipped passenger trains cover the distance of two hundred and seventy-nine miles in twenty-two hours, or less than half the time required to go from La Paz to either Antofagasta or Molendo. The route is so short, however, that the quick transition from the coast to the plateau frequently causes *soroche*, and therefore most passengers prefer a longer and more gradual ascent up the mountains.

The Arica line is most valuable to Bolivia as a freight



Motor roads have proved especially beneficial in connecting the cold barren plateau with the tropical valleys below, thus making the food products of the latter readily available to the people living on the heights.



The Indians who inhabit the great basin drained by the headwaters of the Amazon are expert raftsmen. The density of the tropical forests makes the streams the chief arteries of travel and communication.

DOWNSPOUTS OF THE PLATEAU

carrier. In fact, the freight traffic is so great that it is often congested, especially at some of the steep grades, where trains are divided and a few cars taken up at a time. In a recent year the road handled sixty-one per cent. of all the imports into Bolivia, as compared with thirty-seven per cent. coming through Mollendo and two per cent. through Antofagasta.

Arica is important not only as a port, but also as a strategic point on the west coast. It is located in an oasis in the desert, and could easily be made the base of naval operations in case of war. In the War of the Pacific in 1879-1884, the Peruvians made their last stand here on the top of the famous "Morro," a high, precipitous cliff rising up from the sea.

The harbour of Arica is protected by an island and by a reef connected with the mainland. It is the chief copper-exporting port for Bolivia. Much of that metal goes to Tacoma, Washington, and the total amount taken by the United States is increasing yearly. As the line is far to the north of the centre of the tin and silver mining district, most of those metals are exported through Antofagasta. Because of the transshipment necessary at Lake Titicaca, very few Bolivian exports go out through Mollendo.

Minerals comprise fully ninety per cent. of Bolivia's exports, and practically all of them go through Arica or Antofagasta. Rubber, another important product, is exported largely through Brazil. Other exports of considerable value are coca, coffee, hides, and quinine, some of which go out of the country by way of Argentina. A certain amount of ore also is shipped by that route.

About half of all the exports of Bolivia are taken by Great Britain. I find the commercial houses of that

LANDS OF THE ANDES AND THE DESERT

country in all the cities and see British manufactured goods everywhere. British capital also financed much of the industrial and railway development of the republic. I am told, however, that for a long time Great Britain had neither commercial nor diplomatic representatives in this country. Relations between the two governments were broken off in the 60's as a result, it is said, of an indignity to which the British minister was subjected at La Paz. Bolivia was then under the rule of the dictator Melgarejo, who demanded that particular homage be paid to his mistress by the guests at one of his official receptions. This the minister refused to do. Melgarejo was furious and the next day caused the offending diplomat to be tied to the back of a mule facing the animal's tail and driven about the plaza of La Paz.

When the minister returned to England and reported his ignominious treatment at the hands of Melgarejo, Queen Victoria in great indignation demanded a map so that she could see where Bolivia was. Then, as the story goes, when she learned that the location of La Paz made redress impossible by means of a British warship, she seized a pen and crossed the country off the map, exclaiming:

"As far as England is concerned, Bolivia no longer exists!"

It was forty years or so before England again sent an official representative here.

Another story of this same Melgarejo is that when the Franco-Prussian War was declared he decided to offer the services of his army to France. His soldiers were mobilized and started on the march. As they left La Paz behind them, one of the generals of the army, though trem-

DOWNSPOUTS OF THE PLATEAU

bling at his presumption in daring to question his commander, mustered up his courage and ventured to ask what arrangements had been made for crossing the ocean.

"Ocean!" shouted Melgarejo. "What ocean?"

Needless to say, when he had been enlightened on a few facts of elementary geography, his army's destination was changed to La Paz instead of France.

Next to Great Britain, Bolivia's best customer for its exports is the United States. We take more than forty per cent. of all that it sells, and at the same time lead in furnishing its imports. The principal articles it buys from us are mining machinery, cotton goods, sacks for shipping ore, and food-stuffs. In a recent year wheat flour was the chief commodity imported; much of it came from the United States and the rest from Chile.

Because of the high cost of coal and the lack of developed water-power, together with the limited supply of raw materials on the plateau, there is little manufacturing in Bolivia. However, the business man who attempts to sell large quantities of expensive manufactured goods here is wasting his time. The Indians comprise more than half the entire population of the country, and their wants will be strictly limited for years to come. Most of them know nothing about luxury articles, and could not afford them if they did. Some *cholos*, it is true, spend their money freely on showy jewellery, toilet articles, and gaudy wearing apparel, and, when they can, buy brass bedsteads and other furniture of what they consider a highly ornamental type. Although the wealthy Bolivians have homes as beautifully furnished as can be found anywhere, and pay more attention to dress than we do, they number a very small proportion of the entire population. Indeed, a

LANDS OF THE ANDES AND THE DESERT

survey made a few years ago disclosed the fact that there were not more than a hundred Bolivian families with an income exceeding ten thousand dollars a year.

Foreign commercial firms in the past have often made the mistake of sending representatives to the plateau to sell merchandise adapted for use in warm countries. A story is told of one salesman who came into Bolivia with huge sample cases packed with all kinds of tropical goods such as he had been selling in Brazil. When he reached the high plateau, imagine his consternation at finding a climate so cold that he was uncomfortable even after he had put on his heaviest clothing. Being obliged to eat in his overcoat was the last straw, and he took the next train back to the coast. Only when it was too late for the knowledge to be of any use to him did he learn that he could have gone over the mountains and down to Cochabamba and found a market for all his goods.

As in Peru, the firm of W. R. Grace and Company has been long a power in Bolivia. It helped to negotiate the first great railroad loan for the country, and through it came large importations of American machinery, rails, and rolling stock. It was also largely responsible for bringing in the American engineers who laid out the lines and superintended the construction. The firm now has sales agencies in every part of the republic, and its La Paz establishment is the biggest wholesale house in Bolivia.

During my stay here I have had a talk with the local director of this American company. He was born in Bolivia, and thoroughly understands the people and their needs. He is also well posted as to our American interests, having had some experience in the United States



Backwoods Bolivia contains more than half the area of the republic, is six times as big as Illinois, and although now undeveloped is potentially one of the richest agricultural and forest regions in the world.



The coca leaf, which the Indians chew for its narcotic effect, grows on the eastern slopes of the Andean range. Its culture is much like that of tea, which can also be raised here.

DOWNSPOUTS OF THE PLATEAU

in a diplomatic capacity. I asked him particularly about credit in Bolivia, to which he replied:

"The Bolivian merchants pay for what they order, and there is no trouble in making collections. The national credit is also good, and has been ever since the first loan made in New York for financing our railroads. Before that time it was almost impossible for us to get money from Europe. When I went to London to borrow a million dollars to build a railroad from Lake Titicaca to La Paz, I could not get any one to listen to me. After the New York loan was made, the financial powers of Europe began to wake up. They decided that if the credit of Bolivia was good enough for the Americans it ought to be good enough for them, and since then we have had no trouble in borrowing."

CHAPTER XXIX

THE BACKWOODS OF BOLIVIA

EAST of the Andes is a Bolivia that seems almost another world when compared with the high plateau and mountain regions over which I have been travelling. It is the backwoods of the republic, inhabited chiefly by savages, and is almost an unknown land. Nevertheless, it contains more than half the area of the whole country, and is said to be one of the richest regions in the world.

Trans-Andean Bolivia is one tenth as big as the United States. It is equal to six states the size of Illinois, and is much larger than either Germany or France. It consists of fertile plains that slope from the mountains toward the east, south, and north, gradually falling to a general level where the highest points are only about sixteen hundred feet above the sea. The plain loses itself at the north in the Amazon Valley, and at the east and south in the valleys of the Paraguay and the Paraná.

The region is, in fact, a continuation of the great cattle lands of Argentina, Paraguay, and Brazil, and it may eventually furnish a part of the meat supply of the continent. Along the banks of the Pilcomayo River near Paraguay roam thousands of wild cattle, descendants of the stray animals that wandered from the early ranches of northern Argentina. There are wild cattle also in northern Bolivia not far from a tract of five million acres

THE BACKWOODS OF BOLIVIA

taken up by a Brazilian land and cattle company. That tract has the finest of pasture, and is already stocked with hundreds of thousands of beef cattle. A short extension of the Brazilian railways would reach the Bolivian pasture lands and bring them much nearer the Atlantic seaboard than are our cattle lands west of the Mississippi, from where we have shipped vast quantities of meat to Europe.

The eastern section of the republic is agriculturally, by far the best part of Bolivia, and may some day support a great population. It is well watered by tributaries of the Amazon and the Paraná, and has sufficient rainfall for crops. The region is one of the largest blocks of good undeveloped land in the world, much of it resembling the prairies of Illinois and Iowa of fifty years ago. The climate is exceptionally healthful.

Much of eastern Bolivia is still inaccessible and cannot be opened up to colonization until it is tapped by railways. There is now no way to reach these fertile backwoods except on foot or on muleback, and there are no practical means for marketing farm products. Nevertheless, colonists and land promoters are anticipating the railways that will be built before many years, and more and more land is being taken up by settlers. In 1923, for example, a tract of forty-seven thousand acres not far from the railway that is to connect Buenos Aires and La Paz was leased for ninety-nine years by a former congressman of the United States.

In the southeastern corner of the republic much of the land is a part of the region known as the Gran Chaco, which extends into Paraguay and Argentina. In contrast with the well-watered region about the Amazon headwaters, it is almost riverless, and will never be important

LANDS OF THE ANDES AND THE DESERT

agriculturally. Farther west and higher up, however, are grassy rolling plains that are beginning to be stocked with herds of domestic cattle. Cheese is still the only dairy product of any importance, but in some places water-power has been utilized for the manufacture of ice for butter making. This district is not far from the modern farms and villages of northern Argentina, and promises some day to be quite as important.

I have already spoken of the projected line from Cochabamba to Santa Cruz, which lies in the heart of the oil country, and which will eventually be a great railroad centre. The city is also the centre of the republic geographically. It is now connected with the rail-head at Cochabamba by mule trail and motor road. There are also roads leading from it south to the railway at La Quiaca on the Argentine border, and to Puerto Suarez on the Paraguay River. The first automobile driven over the latter road made the trip in less than five days of actual travelling, although ox carts take from thirty to forty days when the road is in its best condition. In the wet season the government mail carrier rides over the route on the backs of bullocks.

Although some of the roads of eastern Bolivia are used by motor trucks and automobiles during the dry season, most of them are mere trails that can be followed only on muleback, or at best by the native ox carts. The carts are made entirely of wood and usually proceed through the country accompanied by the rasping creaks of their ungreased wooden axles. During recent years some four-wheeled wagons of foreign manufacture have been brought in.

East of Cochabamba some of the land is irrigated and

THE BACKWOODS OF BOLIVIA

produces large crops of alfalfa, maize, grapes, vegetables, and wheat. Some of the best seed of the United States and Argentina has been imported to encourage the production of wheat in Bolivia. The Indians of this region have an unusual method of threshing their crop. Two or three native musicians sit on the top of a stack of grain playing their weird melodies on reed pipes, while several mules are driven round and round at the base of the stack. Bundles of wheat are thrown down in front of the animals, which trample out the grain with their hoofs. Other Indians form a circle surrounding the stack, with ropes stretched between them to keep the mules from running away.

In the same region can be grown cacao and tobacco, and also Indian corn. Indeed, eastern Bolivia promises to be one of the great corn countries of the future. As many as twenty-seven different varieties are grown, some with grains not bigger than those of pop-corn, while the kernels of others are as large as the end of my thumb.

Eastern Bolivia may also be one of the cotton lands of the future. Farmers who have experimented with seed from America and Egypt find that cotton can be grown up to an altitude of eight or nine thousand feet above the sea. Indeed, some good cotton is being raised both here and in Peru in the depressions of the high plateau and on the slopes that lead down into the valleys. When I asked the governor of the Peruvian department of Cuzco about the agricultural development of the Andean region, he brought out some cotton bolls grown on his own farm. The lint was comparatively short, but was beautifully white and silky. That cotton was planted in January and was ready for picking in August.

LANDS OF THE ANDES AND THE DESERT

The governor said that tea also grew well there, and that he believed the mountainsides bordering the valley of Cuzco might some day be covered with tea plantations. So far, tea bushes have been cultivated only on a small scale, the seed having been imported from Japan and China. The plants are easily raised, and, as the labour needed costs only a few dollars a month, it is thought that the business can be made a profitable one.

One of the reasons for the tea experiments has been the hope that it might take the place of coca, which, owing to the fluctuation in the price of cocaine, often yields practically no profits. Coca is raised on vast tracts in Peru and Bolivia, thriving particularly in the temperate altitudes of the Yungas. It is set out in terraces, and begins to bear the second year after sprouting. The leaves are then stripped from the shrub, dried and pressed into bales of fifty pounds each, and sent on muleback to La Paz. Most of the coca of Bolivia is sold to the natives, although considerable quantities are exported to Argentina and Chile, and some to England.

Another medicinal product of this part of Bolivia is quinine, which is made from the bark of the cinchona tree. Quinine is often called Peruvian bark, as the first used in Europe came from Peru. For a long time Bolivia and Peru had a monopoly on quinine production, and in order to hold it they forbade the sending of cinchona seeds out of the country. However, some were taken to Ceylon and other parts of India, where plantations were started, and within a few years the Indian quinine was competing with that of South America. Later still the seeds were carried to Java, which is now producing most of the quinine of the world.

THE BACKWOODS OF BOLIVIA

With the development of the plantation product, the Bolivian bark was unable to hold its former place in the world market, and the fall in prices brought financial ruin to many Bolivians. The bark at one time was so cheap that it did not pay to cut it and carry it to the markets. Although the industry has now revived somewhat here, it still yields only a small profit.

The great forests in which the cinchona trees are found cover about one fifth of trans-Andean Bolivia, and contain timber as good as any in South America. The cabinet woods include ebony, walnut, mahogany, cedar, and quebracho. Some of it is so hard it will turn the edge of an ax, and most of it takes a beautiful polish. Many varieties are so heavy that the logs will not float.

The forest regions contain so many rubber trees that Bolivia ranks next to Brazil in the total production of South America. The rubber comes from two varieties of trees. One has to be cut down to yield its *latex*, or sap, while the other is tapped. The usual procedure is to tap the trees for a certain number of years and then let them remain idle for a like period. The trees grow wild on millions of acres in northern Bolivia across the border from the great rubber lands of Brazil, and when the region is opened up by railroads the annual yield of the country will be increased many times. Even now rubber ranks next to minerals among Bolivia's exports, although the fact that the country has no seaport has caused much of its product in the past to be marketed as Pará rubber, from the Brazilian port through which most of it is exported.

I have heard many stories about the Indians and the wild animals of the vast unexplored backwoods country that slopes down to the Amazon Valley. In crossing

LANDS OF THE ANDES AND THE DESERT

Lake Titicaca, I travelled with an American railroad contractor engaged on one of the lines now under construction. He had been taking a vacation of two or three months, and had just returned from a gold-prospecting tour along the Madre de Dios, one of the tributaries of the Amazon. Travelling on foot, he followed the course of that river through lands known only to the Indians. Starting from Cuzco with a guide, an interpreter, and eight Indians, he crossed mountains more than sixteen thousand feet high, making his way from their glaciers and perpetual snows down into a tropical jungle less than a half mile above sea level.

As we sat in the rude hotel at Guaqui, my companion told me something of the animal life he had seen. He said that the country swarms with game, including wild turkeys. Their meat is excellent and tastes like that of our wild turkey. In the woods are droves of peccaries, or wild hogs, and also tapirs and jaguars. The jaguars came around the camp at night, and were seen now and then as the party made its way through the forest.

As much of the journey was along the banks of the river, all that was necessary whenever a fish dinner was wanted was to explode a dynamite cap in the water. A moment later the surface would be covered with dead fish, some as long as a man's arm, and of a delicious flavour. Besides their various finny inhabitants, these streams are alive with alligators. These reptiles are dangerous, and the natives will not go into the waters they infest.

Most of the Indians of backwoods Bolivia are not friendly to foreigners. Their chief weapons are bows and arrows, but they do not seem to have any knowledge of the use of poison on the latter. The members of one of the



The peoples of the upper Amazon basin are still very primitive, and have had little contact with whites. Here they are making a wedding ceremony binding by smashing one stone upon another.



Some of the trans-Andean tribes live chiefly upon game, which they hunt with bows and arrows. At times they paint their faces and engage in ceremonial dances and orgies of drinking a fermented liquor.

THE BACKWOODS OF BOLIVIA

tribes, the Yuracarés, live in family groups. The boys marry at sixteen and the girls at fourteen. If the first child born to a couple is a girl, it is allowed to starve to death. They seem to have no gods or objects of worship, but at frequent intervals they hold a ceremony in which they decorate themselves with gay costumes, paint their faces with blue or black spots, and indulge in songs and dances.

The gayety of the celebration is usually increased by liberal drinks of an intoxicating liquor made from the yucca plant. In making it, they peel and cook the roots of that vegetable and then chew them as corn is chewed in the preparation of *chicha*. The saliva-soaked mixture, when thinned with water, soon starts to ferment.

Missions have been established to civilize the Yuracarés but with no great success. These Indians are comparatively tractable, and learn to cultivate the soil and follow the white man's customs, but a family is liable at any time to run off and revert to the savage mode of living. It is said that salt is one of the chief factors in keeping the Indians at the missions. If they stay long enough to become accustomed to its use, they cannot withstand their craving for it when they return to the wilds.

Another tribe of eastern Bolivia is that of the warlike Sirionés. Their food is largely game, and they hunt with bows and arrows so powerful that they have to use both hands and feet to shoot them. Farther south are the peaceful Chiriguanos, who paint their faces and bodies with gaudy colours, and wear plugs or buttons in their lips. None of these lowland Indians wear as many clothes as do the Quichuas and Aymarás of the cold plateau, and they are generally more cleanly. They bathe frequently in the

LANDS OF THE ANDES AND THE DESERT

streams, and wash their garments by pounding them between stones.

At present, these wild tribes have but little contact with the white man, and for the most part are still free to live as they please. Their descendants, however, will undoubtedly see all their country opened up by the forces of our money-making civilization and the heart of the South American continent yielding up food and other products for the satisfaction of the wants of mankind. The great progress already made in the more developed portions of these countries in the years between my trips here is only an indication of the even greater things to come.

INDEX

INDEX

- Agricultural Association of Ecuador, organization of, 40.
- Agricultural experiments on the high Andes, 138.
- Agriculture, in Bolivia, 260.
- Aguarunas, warlike Indians of Ecuador, 59.
- Airplanes, development of mail and passenger traffic, 2; service between Barranquilla, Girardot, and Bogotá, 12; rates for passengers and mail, 13; Colombian War Department establishes national school of aviation, 13; newspaper delivery service inaugurated by *El Telégrafo* at Guayaquil, 29; air routes being developed in Bolivia, 253.
- Alcohol, natives become slaves to, 174 *et seq.*; how sold, 177.
- Alpacas, and their wool, 143; domesticated by the Incas, 147.
- Amazon, proposed railway from Oroya, Peru, to tributaries of, 101.
- American goods, in Peru, 89, 106.
- American Institute at La Paz, of great service to the Indian, 229.
- Andes, wonderful formations of the, 124.
- Antioquia province, chief gold region of Colombia, 18.
- Antofagasta, formerly Bolivian territory, 257.
- Antofagasta and Bolivian Railway, one of the famous scenic routes of the world, 254.
- Arequipa, metropolis of southern Peru, 127 *et seq.*
- Argentina, comparative size, 3. —
- Arica, important port and strategic point, 259.
- Astronomical observatory of Harvard University at Arequipa, 132.
- Astronomy, of the Incas, 148.
- Atahualpa, Inca king, killed by Pizarro, 71, 148.
- Automobiles, in Guayaquil, 25.
- Aymará Indians, their legends of the Creation, and the Flood, 220; their ancient history and present condition, 223 *et seq.*
- Bailey, Professor, establishes meteorological station on Mount Misti, in Peru, 134.
- Bananas, production of and value of foreign trade in, of Colombia, 15.
- Bandelier, Professor Adolph, researches in ruins of Tiahuanaco, 218.
- Barranca Bermeja, oil refinery established at, by American corporation, 21.
- Barranquilla, distance from New York, 11.
- Beni River, Bolivia, much gold washed from, 248.
- Bingham, Professor Hiram, discovers ruins of Mechu-Picchu, 154.
- Bismuth, the world market controlled by Bolivia, 250.
- Blow-gun, favourite weapon of Ecuador Indians, 57.
- Boats, formed of reeds, used on Lake Titicaca, 191.
- Bodegas, a town built in the water, 35.
- Bogotá, beauty of the airplane route to, 13; history of city and points of interest, 14.
- Bolívar, Simón, the Emancipator, 196.
- Bolivia, comparative size, 3; the Tibet of South America, 184 *et seq.*; attains independence, 196; its size and resources, 197; The President and government branches, 201; a ride on the government mail coach, 235; the great tin mines, 240 *et seq.*; weakness of her mining laws, 250; extent of the railroad system, 252; extent of trade with Great Britain, 259, with United States, 261; credit of merchants excellent in Europe

INDEX

- and the United States, 263; the rich lands in the backwoods of the republic, 264 *et seq.*
- Borden, Uriah H., donor of astronomical observatory at Arequipa to Harvard University, 133.
- Bows and arrows, the chief weapons of Bolivian Indians, 270.
- Brazil, comparative size, 3.
- Bubonic plague, prevalent in Guayaquil, 29, until city cleaned up by General Gorgas, 31.
- Bucay, railroad town in Ecuador, 46.
- Buenaventura, chief Pacific port of Colombia, 11.
- Bull-fighting, in Lima, 76.
- Buried treasure of the Incas, stories of, 165 *et seq.*
- Caamaño Tenguel Estate, largest cacao plantation in Ecuador, 41.
- Cachibos, cannibal Indians in Peru, 58.
- Cacao, its production, and export, 39.
- Cajamarca, Peru, ancient city of the Incas, 71.
- Cali, metropolis of Cauca Valley, Colombia, 12.
- Callao, Peru, port of entry for Lima, 75, 91.
- Canar, Ecuador, silver deposits at, 34.
- Cannibalism, among Indians of the Andes, 58.
- Casapalca, station on Central Railway of Peru, 100.
- Cathedral of Cuzco, one of the finest in South America, 157, 158; story of its building, 166.
- Catholicism, principal religion in Ecuador, 49.
- Cats, a rarity in La Paz, 210.
- Cattle, on the Peruvian plateau, 140, in Trans-Andean Bolivia, 264.
- Cauca River Valley, one of the most beautiful and productive regions of South America, 11.
- Central Railway of Peru, highest railroad in the world, 93 *et seq.*; gravity car trip down the Andes, 121.
- Cerro de Pasco, mining town on the top of the Andes, 104, *et seq.*
- Cerro de Pasco Copper Corporation, an American syndicate, 104, 113.
- Cerro de Pasco silver and copper mines, 95, 112, *et seq.*; copper practically a by-product, 247.
- Chachani, Mount, near Arequipa, Peru, 129, meteorological station formerly on, 133.
- Chagres fever, prevalence at Guayaquil, 30.
- Chalona, dried mutton preserved through a freezing process, 225.
- Chibchas, once a highly developed race now slaves to alcohol and the coca leaf, 174.
- Cbicba, the native intoxicant, 178.
- Chicken yards on the roofs, a custom in Lima, Peru, 78.
- Child "slavery," in Peru and Bolivia, 224.
- Chile, comparative size, 3, wars with Bolivia and Peru for possession of nitrate fields, 257.
- Chilean State Railways, line opened up from Arica to La Paz, 258.
- Chimborazo, Mount, overlooking Guayaquil, 25; sulphur deposits of, 34.
- Chirimoya, a strange fruit in the La Paz markets, 206.
- Chocolate, introduced into Europe by Cortés, 41.
- Cbolas, the, of La Paz, 207.
- Chorillos, Bay of, summer resort of Lima, Peru, 79.
- Chosica, winter resort of Lima, Peru, 79; summer resort, 99.
- Chuiotto, Antonio, founds industrial mission school for Bolivian Indians, 227.
- Chulic, modern village of the Cerro de Pasco Copper Corporation, 117.
- Chulpas, mummies of the, in La Paz museum, 222.
- Cbuño, frozen and dried potatoes, 162; in the La Paz markets, 206.
- Chuquiaquillo gold mine, near La Paz, production of, 248.
- Churches of Cuzco, great number of, 156, 157.
- Coal, abundant in Colombia, 24.
- Coasting down the Andes by rail, 120.
- Coati, or Island of the Moon, in Lake Titicaca, 190.
- Coca, the source of cocaine, 161; the curse of the present-day Indian, 174 *et seq.*; its use by the Incas, 176; how marketed and used, 177; an

INDEX

- important export of Bolivia, 259;
great tracts devoted to culture, in
Bolivia, and Peru, 268
- Cochabamba, largest town, next to La
Paz, in Bolivia, 200
- Cocoa, possibilities in Colombia, 15
- Coffee, chief crop of Colombia, 15;
important export of Ecuador, 42;
an important product of Bolivia,
259
- Colombia, size, topography and cli-
mate, 9; relative distances from the
United States, 10; establishes modern
fiscal system with American
treaty payments, 10; early settle-
ment, 14; agricultural resources, 14;
great need of railways, 16; most
of country's freight transported on
river systems, 16; chief gold-
producing country of the Spanish
possessions, 18; second country in
the world in production of platinum,
20; development of rich petroleum
fields, 21; produces world's supply
of emeralds under State monopoly,
22
- Copacabana, shrine of Our Lady of,
at Lake Titicaca, 187
- Copper, chief mines of Bolivia, 248;
Bolivian product chiefly exported
through Arica, 259
- Corn, with kernels of immense size, in
Peru and Bolivia, 85, 162, 205, 267;
possibilities of great production in
Bolivia, 267
- Corocoro, centre of copper-producing
section, Bolivia, 248
- Cotopaxi, highest active volcano, 25
- Cotton, grown in Colombia, 15; large
crops of in oasis of Peruvian desert,
66; of fine grade, 68; possibilities of
great production in Bolivia, 267
- Crucero Alto, highest pass on South-
ern Railway of Peru, 136
- Cuzco, the ancient capital of the
Incas, 145 *et seq.*; the city of to-day,
156 *et seq.*
- De Ulloa, Antonio, makes early report
of platinum discoveries in Colombia,
20
- Desaguadero River, outlet of Lake
Titicaca, 186
- Desert of Peru, location and extent,
64 *et seq.*
- Duck shooting on Lake Titicaca, 192;
- Duran, terminal of Guayaquil and
Quito Railroad, 46
- Ear plugs, of the Indians of the Andes,
58
- Ecuador, comparative size, 3; trade
with the United States, 28; size and
topography, 32; minerals, 33; form
of government, 50
- Education, of the natives in Peru, 184;
in Bolivia, 230
- El Telégrafo*, inaugurates newspaper
delivery by airplane from Guaya-
quil, 29
- Emeralds, practically all of world's
supply produced in Colombia, 21
- Eten, Peru, passengers landed under
difficulties at, 71
- Farm implements, of the Peruvian
Indians, 138
- Farming on the Andean plateaus, 136
et seq.
- Fire worship of the Incas, 149
- Fish, varieties in Lima markets, 86
- Frick, Henry C., interested in Cerro
de Pasco Copper Corporation, 113
- Fruits and vegetables, of the Lima
markets, 85; in great variety at
Arequipa, Peru, 130; in La Paz
markets, 206
- Fuel, scarcity of, in Bolivia, 208
- Galapagos Islands, strangest in the
world, 51; of strategic importance,
53
- Galera Tunnel, on Central Railway of
Peru, 100
- German army aviators, in the air-
plane service between Colombian
cities, 12
- German trade in Peru, reestablish-
ment of, 89
- Gold, the rich mines of Colombia ante-
date Spanish conquest, 18; rich
deposits in Peru, 103, 118; stories
of the buried treasure of the Incas,
165 *et seq.*; production of Bolivian
mines, 248
- Golf, at La Paz, 212
- Gorgas, Colonel William C., in co-
operation with Rockefeller Foun-
dation cleans up Guayaquil, 31
- Grace, W. R., & Co., chief American

INDEX

- business firm on South American west coast, 90; a power in Bolivia, 202.
- Guaqui, on Lake Titicaca, 186, 194.
- Guatavita, sacred lake of the gold offerings, 19.
- Guayaquil, the city and its people, 25; as a commercial port, 28; city known as "the pest hole of the Pacific," 29, until cleaned up by General Gorgas, 31.
- Guayaquil and Quito Railroad, a journey over, 46; difficulties in road building, 47.
- Guayas, largest river on western side of South America, 27.
- Guggenheim tin properties, in Bolivia, 245.
- Guinea pigs, as food in Lima, 86.
- Gutiérrez, García, treasure found by, 166.
- Haciendas of the Andean plateau, 180.
- Haggin, J. B., interested in Cerro de Pasco Copper Corporation, 113.
- Harman, Archer, builder of Guayaquil and Quito Railroad, 47.
- Harvard University astronomical observatory at Arequipa, 132.
- Hides, an important export of Bolivia, 259.
- Horse-racing, a rival of bull-fighting in Lima, 76.
- Hotels, of Peru, 90.
- Huachipairis, curious Indian tribe in Peru, 59.
- Huallatiri, Mount, snow-clad peak of Bolivia, 198.
- Huancavelica, Peru, mercury mines at, 118.
- Huancayo, end of Central Railway of Peru, 95, 100.
- Huanchaca silver mines, Bolivia, worked before Spanish Conquest, 247.
- Huigra, railroad town in Ecuador, 46.
- Huts, of the native Indians, 179.
- Illimani, Mount, or "Snow Mountain," 194.
- Inca Chronicle*, monthly magazine published at Cerro de Pasco, Peru, 108.
- Inca Mining Company, gold mines of, 118.
- Incas, ancient civilization of the, 145.
- Indians, of Ecuador, religious belief and customs, 59; their life on the haciendas in practical peonage, 181; of eastern Bolivia, 270.
- Industrial mission school, of great help to Bolivian Indians, 227.
- Investments, of Americans in South American bonds, 4.
- Ipecac, important export of Colombia, 15.
- Iquitos, Peru, one of the chief rubber ports of the world, 102.
- Irrigation, in Rimac Valley, Peru, 99; along Vilcanota River in Peru, 139; ancient irrigating canals of the Incas, 147, in Bolivia, 266.
- Island of the Moon, or Coati, in Lake Titicaca, 190.
- Island of the Sun, in Lake Titicaca, 189.
- Ivory nuts, an important export of Ecuador, 43; of Peru, 102.
- Jequetepeque Valley, Peru, site of ancient civilization at, 74.
- Jivaro Indians, and their custom of curing heads, 54 *et seq.*
- Juliaca, station at fork of Southern Railway of Peru, 136.
- Labour, condition of the native, 181 *et seq.*
- Lake Pampa Aullagas, or Lake Poopo, 186, 187.
- Lake Titicaca, oil wells at, 69; highest steam-navigated body of water, 186 *et seq.*
- Lake Urcos, buried treasure of, 165.
- La Paz, commercial centre of Bolivia, 194; Sunday the great market day, 202; the American Institute and its good work, 229; school of aviation established at, 254.
- La Paz Cathedral, in course of erection for eighty years, 211.
- La Paz-Antofagasta railway, trip over, to Oruro, 233.
- Lima, the capital of Peru, 75 *et seq.*; the shops and markets, 84 *et seq.*
- Liquor, a curse to the modern native, 174 *et seq.*
- Llallagua tin mine, Bolivia, production of 243.

INDEX

- Llamas, domesticated by the Incas, 147; beast of burden of the Andes, 100, 105, 141, 208.
- Llama manure, chief fuel of La Paz 208, 209; as fuel for the tin mines at Oruro, 241.
- Lobitos oil fields, in Peru, 69.
- Machu-Picchu, ruins of ancient Inca city, 154.
- Malaria, continuously prevalent in Guayaquil, 29, until eradicated by General Gorgas, 31.
- Manco Ccapac, the first great Inca ruler, 145; his palace at Cuzco, 151, 152; the sacred rock of, in Lake Titicaca, 189.
- Markets and shops, of Lima, 84 *et seq.*; of Cuzco, 161; of La Paz, 202.
- Matarani, proposed as new port of entry for Arequipa, Peru, 127.
- Matucana, station on Central Railway of Peru, 100.
- Meals, on shipboard, 8.
- Meiggs, Henry, builder of steel pier at Pacasmayo, 71; of Central Railway of Peru, 95.
- Melgarejo, former dictator of Bolivia, cause of severance of diplomatic relations with Great Britain, 260.
- Mercury mines, at Huancavelica, Peru, 118.
- Meteorological station, removed from Mt. Chachani to Mt. Misti, 133.
- Methodist Episcopal Church, establishes American Institute at La Paz, 229, secondary school at Cochabamba, 230.
- Metropolitan Cathedral, Sucre, wealthiest in Bolivia, 201.
- Military service compulsory in Bolivia, 227.
- Misti, Mount, great volcano near Arequipa, 129; Harvard University astronomical observatory on, 132; meteorological station removed to, 133; height of, 133; slope covered with lava, 136.
- Mollendo, port of entry for Arequipa, Peru, 127.
- Morococha mines, at the top of the Andes, 94.
- Mosquitoes, responsible for malaria and yellow fever epidemics at Guayaquil, 31.
- Mummies, of ancient races of Peru, 73; in La Paz museum, 222.
- Muzo, emerald mines at, worked under Colombian government monopoly, 22.
- Oases, irrigated, in the Peruvian desert, 66.
- Oil, development of industry in Colombia, 21; Santa Elena oil fields, Ecuador, 34; wells and refineries in Peru, 69; the deposits in Bolivia, 249.
- Oil-burning locomotives on Ecuador railway, 46; on Central Railway of Peru, 96.
- Ollantaytambo, Inca ruins of, 154.
- "One-way" highways in the Andes, 101.
- Oroya, on Central Railway of Peru, 100.
- Oruro, trip to from La Paz, 232; an unattractive city, 234; the great tin mines at, 241.
- Our Lady of Copacabana, shrine of at Lake Titicaca, 187.
- Pacasmayo, Peru, has steel pier and railroad, 71.
- Paco-vicuña, cross between the alpaca and vicuña, 144.
- Paintings, in Cathedral of Cuzco, 158.
- Paita, in the desert section of Peru, 67.
- Pampa Aullagas, or Lake Poopo, 186.
- Panama, attains independence from Colombia, 10; great yellow fever epidemic of 1905, 30.
- Panama hats, production in Colombia, 15; sold by the natives at Guayaquil, 27; made in Ecuador Colombia, and Peru, not Panama, 70; how made, 71.
- Pan-American railway route, amount completed, 256.
- Papayas, in Guayaquil markets, 27.
- Paraguay, comparative size, 3.
- Paraná, potentially the world's richest bread basket, 4.
- Parinacota, Mount, snow-clad peak of Bolivia, 198.
- Patiño, Simon I., "tin king" of Bolivia, 243.
- Peddlers, women and men, of Peru, 87.
- Penny, Andrew, made fortune in Bolivian tin mine, 244.

INDEX

- Peonage, in Ecuador, 62; on Andean haciendas, 181.
- Pepper, use in food of Peruvians, 86.
- Peru, comparative size and topography, 64; the great desert district, 65; the president, cabinet, and legislative branches, 83.
- Peruvian Corporation, plans to develop agricultural resources of Andean plateau, 138.
- Petroleum, principal fields of Colombia, 21; Santa Elena oil fields, in Ecuador, 34; wells and refineries in Peru, 69; deposits in Bolivia, 249.
- Pichincha, active volcano near Quito, 47.
- Piura Valley, rich desert oasis in Peru, 67.
- Pizarro, lands in Ecuador on way to conquer Peru, 26; his bones on exhibit in Cathedral at Lima, 80.
- Platinum, large deposits of, in Colombia, 20.
- Pneumonia, danger of, in high altitudes, 111.
- Poisoned arrows, used by Indians of Ecuador, 57, 58; unknown to those of Bolivia, 270.
- Pomarapi, Mount, snow-clad peak of Bolivia, 108.
- Potatoes, largely used in Peruvian menu, 86; Peru the natural home of, 162; red, white, and pink, in Bolivia, 206.
- Potosí, the great silver-mining centre of Bolivia, 246.
- Pottery, of the ancient Incas, 148.
- Puno, on Lake Titicaca, 188.
- Quichuas, chief church-goers of Peru, 159; once a highly developed race, now slaves to alcohol and the coca leaf, 174.
- Quinine, an important export of Bolivia, 259; yields only small profit, 268.
- Quisere River, Bolivia, gold being found in, 249.
- Quito, airplane service to and from Guayaquil, 29; capital of Ecuador, 45, 47.
- Radio towers, on San Cristóbal hill overlooking Lima, 75.
- Railroad, the highest, in the world, 93 *et seq.*
- Railroads, tracks submerged by sand in Peruvian desert, 67; their development in Bolivia, 252 *et seq.*
- Reeds, used for making boats, ropes, and baskets by Lake Titicaca Indians, 191.
- Religion, more freedom in worship in Peru, 82; of the people of the Andes, 159.
- Religious beliefs of Indians of the Andes, 59.
- Revolutions, frequently occurring in Ecuador, 51.
- Rimac River, glacial stream flowing through Lima, 76.
- Rimac Valley, agriculture in, 98.
- Rock Forest, a wonderful formation in the Andes, 125.
- Rockefeller Foundation, coöperates with Colonel Gorgas in cleaning up Guayaquil, 31.
- Rodadero, the, toboggan slide of the Incas, 154.
- Roller coaster trip down the Andes, 120.
- Rubber, grown in Colombia, 15; important export of Ecuador, 42; of Peru, 102, 103; of Bolivia, 259; extent of the wild forests, 269.
- Ruins, of ancient Inca buildings, 149 *et seq.*; of ancient peoples, in Peru, 73.
- Ruminagui, buries Inca treasure of Quito, 169.
- Sacsahuaman, ancient fortifications of, at Cuzco, 151, 152.
- Sajama, Mount, high peak of Bolivia, 198; Indian legend of, 233.
- Salaverry, Peru, important sugar exporting town, 73.
- Salt, its effect on civilization of the Bolivian Indians, 271.
- Salvadora tin mine, Bolivia, production of, 243.
- San Cristóbal, hill overlooking Lima, 75.
- San Lorenzo, island of, Peru, 75, 91.
- Santa Cruz, centre of production of Bolivian oil fields, 249; prospects for great future, 266.
- Sea food, of the Lima markets, 86.
- Sheep, on the Peruvian plateau, 140.

INDEX

- Shops and markets of Lima, 84 *et seq.*
 Sicuani, town on Southern Railway of Peru, 136.
 Silver mining, in Bolivia, 246.
 Sironés, warlike tribe of Indians in eastern Bolivia, 271.
Soroche, or mountain sickness, 96, 109, 258.
 Southern Railway of Peru, headquarters at Arequipa, 130.
 Squier, Ephraim George, researches in ruins of Tiahuanaco, 218.
 Standard Oil Company, purchases huge tract in Bolivian oil fields, 249.
 Stock raising, on the Peruvian plateau, 140.
 Stone masonry, remarkable, of the Incas, 151, 152.
 Sucre, legal capital of Bolivia, 200.
 Sugar, large crops of in Peru, 66.
 Talara, petroleum shipping port of Peru, 69.
 Tamboraque, the beginning of vegetation, on arid Andes, 98.
 Tea, possibilities of culture in Bolivia, 268.
 Temple of the Sun, Aztec structure at Cuzco, 149; the treasures of, 166.
 Tenguel, a cacao town in Ecuador, 41.
 Tiahuanaco, ruins of the oldest city in the Americas, 214 *et seq.*
 Ticlio, highest point on world's highest railroad, 94, 100; coasting down the Andes from, 121.
 Tin, the great mines of Bolivia, 240 *et seq.*
 Titicaca Island, or Island of the Sun, 189.
 Titicaca, Lake, oil wells at, 69; highest steam-navigated body of water, 186.
 Tonka bean, production of in Colombia and uses of, 15.
 Torture stones of the Inquisition, 151.
 Transportation in Ecuador, difficulties and high cost, 45, 50.
 Treaty of Ancón, giving Peruvian territory to Chile, 257.
 Trujillo, Peru, founded by Pizarro, 73.
 Tumbes oil wells, in Peru, 69.
 Tungsten, Bolivia the greatest source of, 250.
 Tupac Amaru, Inca beheaded at Cuzco by Spaniards, 156.
 Urbina, highest station on Ecuador railroad, 47.
 Urcos, stories of treasure buried at, 165.
 Valverde, manuscript of, describing hiding place of Atahualpa's treasure, 172.
 Vanadium mines, in Peru, 119.
 Vegetable ivory, an important export of Ecuador, 43.
 Vegetables and fruits of the Lima markets, 85; in great variety at Arequipa, Peru, 130; in La Paz markets, 206.
 Vicuñas and their valuable wool, 143.
 Vilcanota River, Peru, irrigated farms along, 139.
 Vitcos, Inca ruins at, 154.
 Water, supplied by peddlers in Peru, 67.
West Coast Leader, an American newspaper enterprise in Lima, 90.
 Wild animal life of eastern Bolivia, 270.
 Witch doctors, travelling, of the Andes, 232.
 Women, more freedom for, in Peru, 82; as peddlers, in Peru, 87; the Indian, of Peru, 107; in the Oruro tin mines, 241.
 Wool, Arequipa the chief market of Peru, 130; from the high Andes, 141.
 Yellow fever, for centuries continually present in Guayaquil, 29; eradicated by General Gorgas, 31.
 Yumbos, peaceable Indians of Ecuador, 59.
 Yungas, the, a district of fertile valleys in Bolivia, 199.
 Yuracaré, customs of, in eastern Bolivia, 271.
 Zaruma gold mines, Ecuador, 34.
 Zarritos, Peru, oil refinery at, 69.

9215

DATE DUE
Date of Loan

No.
918

Carpenter

Carpenter

Lands of the Andes

Se27'39	Apr22'41	Mar19'52	A
Mar30'40	May1'41	Oct11'55	_____
Apr12'40	Apr6'42	Apr11'55	_____
	Apr15'42	Apr11'55	_____
Apr22'40	Apr22'42	Apr11'55	_____
As2'40	May5'42	Apr11'55	_____
	Jul7'42	Apr11'55	_____
Sep21'40	Apr30'43	Apr11'55	_____
Oct2'40	Apr20'44	Apr11'55	_____
	Apr28'44	Apr11'55	_____
Oct12'40	Oct23'44	Apr11'55	_____
	Nov4'44	Apr11'55	_____
Oct19'40	Jan27'47	Apr11'55	_____
	May19'49	Apr11'55	_____
Mar11'41	Nov5'49	Apr11'55	_____
Apr3'41	Mar5'51	Apr11'55	_____
	Jun2'51	Apr11'55	_____
		DEC 07 2006	

FLORIDA STATE UNIVERSITY



3 1254 03624 9858

